Jurisdictional Scan

Administration conducted a jurisdictional review of traffic control signals in cities across North America, Europe and Australia with similar or larger population sizes compared to Edmonton. Administration contacted a total of 34 cities and received 12 responses, which are summarized below in comparison to Edmonton.

Traffic Signal Control

The table below shows a summary of the answers provided by respondents to questions about traffic signal control types and how they are selected.

Adaptive control refers to a system of controlling fully-actuated signals that offer greater flexibility to respond to significant changes in traffic volumes or patterns. In general, it is recommended by vendors for short-term adjustments in areas where unpredictable roadway events or incidents are common, rather than for daily traffic management as it requires additional design, infrastructure and maintenance.

All respondents from Australia use the Sydney Coordinated Adaptive Traffic System (SCATS). The term *adaptive* in SCATS is used differently from the definition used for this jurisdictional scan. SCATS is a fully-actuated system that selects pre-defined signal timing plans based on traffic detection inputs but does not have the same level of flexibility. The City of Edmonton has operated similar signals in several areas in the past. This system was removed, as it routinely selected the same timing plans that the scheduled system would have run, at a higher operating cost.

	Types of traffic signal control used (pre-timed, actuated, adaptive)	Primary deciding factors for traffic control use	Are adaptive controls used	Formal signal operation and prioritization strategy or policy
Edmonton CAN	Pre-timed, and semi/fully-actuated	Safety, pedestrian and traffic volumes, cycling facilities, roadway classifications	No	Follow strategies from documents such as the City Plan and Complete Streets Guidelines
Calgary CAN	Pre-timed and semi/fully-actuated	Modeling, coordination with adjacent intersections	13 signal pilot program in a major commuter corridor with varied traffic	No formal policy; overall strategy to reduce delays
Ottawa CAN	Information not provided	Information not provided	Information not provided	Information not provided
Winnipeg CAN	Pre-timed, and semi/fully-actuated	Street network configuration, intersection spacing, vehicle and pedestrian volumes and other priorities	No	General internal guidelines are used
Vancouver CAN	Pre-timed, and semi/fully-actuated	Demand/volumes, street classification, cycling facilities and safety	Explored, but not implemented	Modal hierarchy from Transportation 2040
Adelaide AUS	SCATS	Development, developer funds, safety, collision data and a new collision program called blackspot	SCATS	Strategy creation in process
Melbourne AUS	Mixed; majority are SCATS	Strategic significance, location and modal demand; gradually converting all signals to SCATS	SCATS	Follows Victoria state strategy

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	Types of traffic signal control used (pre-timed, actuated, adaptive)	Primary deciding factors for traffic control use	Are adaptive controls used	Formal signal operation and prioritization strategy or policy
Perth AUS	Mixed; majority are SCATS	Network strategy, and traffic movement prioritization; subject to change based on real time traffic demands	SCATS	Strategy creation in process; arterial movement is typically prioritized
Sydney AUS	A mix, however, the majority are SCATS	Real-time traffic data	SCATS	Road strategy standards define road use and signal operation is adjusted accordingly
Chicago USA	Majority are pre-timed	Engineering judgment and requests from residents, elected officials or developers that meet MUTCD Warrant	No	None
Denver USA	Downtown is pre-timed and everywhere else is semi-actuated	City goals and factors like volume at a different time of day	Exploring, but not implemented	Moving in a micromobility and pedestrian safety direction
San Francisco USA	76% are pre-timed, remainder are semi/fully-actuated	Location, roadway or signal network, traffic volumes, transit presence and delays	No	Main goal is micromobility
Berlin GER	Pre-timed, and semi/fully-actuated	Volumes, safety, optimization of traffic flow and prioritization of local public transport	No	Technical specifications in place

Accessible (Audible) Pedestrian Signals

The table below shows a summary of the answers provided from respondents on questions regarding accessible pedestrian signal use. The majority of respondents include accessible pedestrian signals in all new signals.

	Where accessible pedestrian signals are used	Percentage of traffic signals with accessible pedestrian signals (approx.)	Other tools for promoting accessibility
Edmonton CAN	In areas of high pedestrian activity (e.g., malls, transit centres, etc.) and in coordination with the Canadian National Institute for the Blind	18%	Curb ramps and tactile pads, pedestrian countdown timers
Calgary CAN	All new signals are equipped with accessible signals or will have them installed during upgrades	35%	Wheelchair ramps with tactile pads
Ottawa CAN	Information not provided	Information not provided	Information not provided
Winnipeg CAN	All signalized intersections	100%	Curb ramps, tactile pads, upgrading bike path loops to radar and trialling touchless buttons
Vancouver CAN	Not a requirement but is best practice	10%	Pre-timed signals at high pedestrian locations, tactile surface curb ramps and double curb ramps
Adelaide AUS	All signalized intersections	100%	No additional information for accessibility

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	Where accessible pedestrian signals are used	Percentage of traffic signals with accessible pedestrian signals (approx.)	Other tools for promoting accessibility
Melbourne AUS	All signalized intersections	100%	Wheelchair detectors and alternative (non-button) pedestrian detection
Perth AUS	All signalized intersections	70%	Currently trialling touchless push buttons
Sydney AUS	All signalized intersections	100%	No additional information for accessibility
Chicago USA	Installed on all new signals	2%	Americans with Disabilities Act compliant ramps are installed at most intersections
Denver USA	Information not provided	Information not provided	Information not provided
San Francisco USA	Installed on all new signals	38%	Municipal website with information on accessible pedestrian signals
Berlin GER	Installed on all new signals and during upgrades	70%	Curbs are equipped with grooved plates that help people with mobility and visual impairments

Detection

The table below shows a summary of the answers provided from respondents on questions regarding different types of detection as related to traffic signal operation.

Respondents indicated that inductive loops are generally the most reliable type of detection. Radar and video detection can be affected by sight line obstructions and weather conditions.

	Type of pedestrian detection	Type of bicycle or micro mobility vehicle detection	Type of vehicle detection	Percent of total signals using pedestrian or micromobility detection (approx.)
Edmonton CAN	Push buttons	Inductive loops, video detection (limited), push buttons	Inductive loops, radar, and video	70%
Calgary CAN	Push buttons	Inductive loops and push buttons	Inductive loops and video	All signals except for downtown core
Ottawa CAN	Information not provided	Information not provided	Information not provided	Information not provided
Winnipeg CAN	Push buttons	Push buttons, inductive loops, radar and looking at video	Inductive loops, radar and trialing video	80%
Vancouver CAN	Push buttons	Push buttons, radar and wireless	Radar and Sensys pucks	100% on non-fixed time signals
Adelaide AUS	Push buttons and video	Inductive loops, push buttons and video	Inductive loops and video	Under 5%

	Type of pedestrian detection	Type of bicycle or micro mobility vehicle detection	Type of vehicle detection	Percent of total signals using pedestrian or micromobility detection (approx.)
Melbourne AUS	Push button, video or infrared	Inductive loops and push buttons	Inductive loops and video	99%
Perth AUS	Push buttons and investigating radar	Inductive loops and push buttons	Inductive loops, radar, thermal, video and magnetic field	Information not provided
Sydney AUS	Push buttons, microwave sensors	Inductive loops and push buttons	Information not provided	100%
Chicago USA	Push buttons but moving away from detection; most signals include a pedestrian phase in each cycle	Inductive loops and moving to towards video	Inductive loops and moving towards video	7%
Denver USA	Push buttons	Infrared camera detection	Infrared camera detection	Information not provided
San Francisco USA	Push buttons	Inductive loops, push buttons, radar and video	Video, inductive loops, magnetic field and wireless radar	20%
Berlin GER	Push buttons, testing video and radar	Push buttons, inductive loops; testing thermal imaging, radar and video	Inductive loops, radar, magnetic field, video and thermal	60%

Data Collection

The table below shows a summary of the answers provided from respondents on questions regarding how they collect data and volume counts for pedestrians, micromobility and vehicles. Data from these devices is used for specific projects and/or to assess traffic patterns that inform signal timing plans and is generally not used for active traffic signal operations. Respondents reported that the quality of the data being provided is generally reliable and accurate. Some equipment needs to be quality-checked to ensure data accuracy.

	Types of monitoring and data collection equipment	What is the frequency of the data collection
Edmonton CAN	Inductive loops, video, thermal and radar	5 or 15 minute intervals, collected daily or monthly
Calgary CAN	Inductive loops for vehicles. Infrared for pedestrians	Real-time, manually collected monthly
Ottawa CAN	Pneumatic tubes, video and radar	In the process of implementing real-time collection
Winnipeg CAN	Pneumatic tubes, microwave, video, infrared and inductive loops	15 minute intervals, manually collected monthly
Vancouver CAN	Sensys pucks, inductive loops, video, infrared, pneumatic tubes and radar	15 minute intervals uploaded daily at midnight
Adelaide AUS	SCATS	Information not provided

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	Types of monitoring and data collection equipment	What is the frequency of the data collection
Melbourne AUS	Radar, inductive loops, video	Real-time
Perth AUS	SCATS, use third parties for GPS data	System is updated every 20 seconds
Sydney AUS	SCATS	Real time volumes are stored in 5 minute intervals
Chicago USA	Video and real time counting	Real-time
Denver USA	Pneumatic tubes, video for pedestrians and turning movement counts	Information not provided
San Francisco USA	Video, hand counts, bluetooth sensors, pneumatic tubes and radar	Information not provided
Berlin GER	Majority are inductive loops and radar	Real-time