Town of Canmore
Integrated Parking Management Plan

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Summary

This report evaluates potential parking management strategies suitable for Canmore's Town Centre. It describes factors to consider when selecting and implementing strategies, including their benefits, costs, implementation requirements, obstacles, and ways to overcome those obstacles. It recommends a set of strategies to be included in an integrated parking management program.

Contents

Introduction

Like most economically successful communities, Canmore, Alberta has parking problems. During peak periods, motorists often have difficulty finding an unoccupied parking space in the Town Center. The Town is considering various solutions, including building additional municipal parking facilities, but that is expensive, cannot solve all parking problems, and contradicts other community goals. As a result, the Town is considering more integrated solutions.

Parking planning is undergoing a paradigm shift, a fundamental change in how problems are perceived and solutions evaluated. The new paradigm considers a wider range of planning goals and solutions, with more emphasis on efficient management of existing supply in order to reduce the number of spaces needed to serve a particular destination, and to ensure that parking policies support strategic goals such as affordability, congestion reduction, and maintaining attractive and walkable streets.

Exhibit 1   **Old and New Parking Paradigms Compared**

Old Paradigm	New Paradigm
Parking problem means inadequate parking supply.	There can be many types of parking problems, including inadequate or excessive supply, too low or high prices, inadequate user information, and inefficient management.
Transportation means driving.	Travelers may use various modes. Not everybody drives.
Abundant parking supply is always desirable.	Too much supply is as harmful as too little.
Parking demand should be satisfied on-site. Walking distances should be minimized.	Parking can often be provided off-site, allowing sharing of parking facilities among various destinations.
Parking should generally be provided free, funded indirectly, through rents and taxes.	As much as possible, users should pay directly for parking facilities.
Parking should be available on a first-come basis.	Parking should be regulated to favor higher priority uses and encourage efficiency.
Parking requirements should be applied rigidly, without exception or variation.	Parking requirements should reflect each particular situation, and should be applied flexibly.
Innovation faces a high burden of proof and should only be applied if proven and widely accepted.	Innovations should be encouraged, since even unsuccessful experiments can provide useful information.
Parking management is a last resort, to be applied only if increasing supply is infeasible.	Parking management programs should be widely applied to prevent parking problems.
Land use dispersion (sprawl) is acceptable or even desirable.	Dispersed, automobile-dependent development can be harmful.

Parking management changes the way parking problems are defined and solutions evaluated.

These solutions can provide significant savings and benefits. New surface parking typically costs $5,000-15,000 per space, and structured parking $50,000-75,000 per space. Considering land, construction and operating expenses, structured parking spaces often cost more than the vehicles they serve. More efficient parking management can save money and help achieve other community planning goals such as reducing vehicle traffic problems, increasing affordability and improving livability.

Canmore has completed and is engaged in several planning projects to help reduce traffic and parking problems while maintaining a vibrant town center. In 2016 Council approved a new Municipal Development Plan (MDP) which guides transportation planning decisions. The MDP envisions that:

> "Canmore is a resilient and vibrant community socially, economically, and environmentally. Its strength is in its resourceful and engaged citizens, who thrive together on the strength of the community's heritage, long-term commitment to the diversity of its people, and health of the mountain landscape."

The MDP establishes the community's overarching vision, goals and guidelines, which provide the basis for current planning efforts, including this plan. In 2014, the Town established an *Integrated Transportation Plan* (ITP) that emphasizes placemaking, which puts a high value on creating places where people want to be, multimodal transportation facilities and services, complete streets roadway design, and improved downtown parking management. Proposed (2018) updates to the ITP establish targets to increase Town Centre area non-auto mode share from the current 20% up to 40% (5% Transit and 35% Active) by 2030. The 2016 *Municipal Development* includes commitments to economic and environmental sustainability, support for the town Centre, and diverse transport options.

The Town administration is working closely with the Business Revitalization Zone (BRZ) to develop an *Integrated Parking Management Plan*. Through this collaboration, various projects and initiatives have been completed in recent years including transit improvements, bicycle friendly business programs, more efficient use of parking spaces, and improved walking and bicycling connections to the Town Centre. The Town and BRZ are now evaluating specific strategies that can achieve these community and BRZ goals.

The Town recently undertook a parking study that quantified various parking problems, including both under-utilization and over-utilization of Town Centre parking facilities. That study recommended that Town Centre parking utilization rates (the portion of parking spaces occupied at a particular time) should generally be 70-85% during normal business hours; utilization rates should be below 70% less than 50% of business hours; and demand should exceed supply (so motorists cannot find an available parking space) less than 1% of business hours. The Town Council accepted these targets for planning purposes in March 2018.

Key 2018 Downtown Parking Study Findings

- Downtown parking utilization exceeds 80-85% approximately 21% of business hours during peak days.
- Parking is under-utilized considering all business hours.
- Approximately 85% of Town centre open space is dedicated to roads and parking facilities.
- Relative little of Town Center space is dedicated to people (walking, dwelling and social connection).

These documents provide useful guidance for parking planning. This *Integrated Parking Management Plan* identifies specific ways to encourage more efficient use of parking resources in order to achieve the community's goals, objectives and targets. The following section describes various factors that should be considered when selecting parking management policies and programs.

Canmore Town Centre Conditions

The following factors were considered when developing this plan.

Canmore is a growing town with an attractive and diverse downtown that attracts both local residents and visitors. Much of the community's economic success and livability results from the Town Centre's attractiveness and vitality. The Town works closely with a number of affiliates and organizations to support local economic development and develop innovative solutions to problems such as parking congestion.

A major portion of the Town Centre's open space, estimated at 85%, is devoted to roads and parking, and some other public spaces, including sidewalks and landscaping, are impaired by signals and signage required for traffic and parking management. Surveys indicate that parking facilities are generally under-utilized. However, during tourist seasons and special events, prime parking areas become heavily congested.

Exhibit 2 **Canmore Town Centre**

A major portion of Canmore's Town Centre land area is devoted to vehicle parking. More efficient management can reduce parking problems and the number of spaces needed to serve visitors and employees.

Town Centre travel and parking demands are changing. Visitors arrive by various modes, and those that drive park in various locations. The Town is improving non-auto travel options (walking, bicycling, and public transit) and encouraging their use. These efforts can reduce the total number of parking spaces needed in the area, and expand the geographic range of parking facilities that serve the Town Centre.

Town Centre area land is expensive, and there is limited room for expansion of roads and parking. As a result, redevelopment is believed to be hampered by parking requirements, including minimum parking requirements in zoning codes, and relatively high in-lieu fees that developers must pay as an alternative to adding on-site parking supply.

Implications of Emerging Mobility Services and Technologies
Travel patterns are likely to change in the future due to various new mobility services and technologies.

New User Information and Payment Systems
New telecommunications systems, such as integrated navigation apps an electronic payment systems facilitate non-auto travel by providing convenient travel information, such as walking and bicycling routes; taxi, ride-hailing and public transit services; and bike- and car-sharing options. Most large cities have some of these technologies, often by private firms that provide a single service, and some have strategic programs to develop integrated systems, such as a single app that provides navigation and payment for multiple modes.

Shared Mobility Services
Dynamic ridesharing and ridehailing services such as Uber and Lyft are already affecting some automobile travel and parking demands, including reductions in vehicle ownership in some urban areas, increases in total vehicle traffic and congestion in some city centres, reductions in parking demand in entertainment districts, and reductions in airport vehicle rentals. This could reduce total parking demand and increase the need for convenient passenger drop-off/pick-up areas.

Autonomous (Self-driving) Vehicles
Autonomous vehicle technologies can affect travel demands in several ways. By making automobile travel less stressful and more productive (occupants can rest or work while travelling) they may encourage some people to take more and longer trips, and choose more sprawled home locations. This could increase traffic problems, including congestion, pollution, accidents and sprawl-related costs. This could further reduce total parking demand, increase the need for convenient passenger drop-off/pick-up areas, and create demand for specialized autonomous vehicle parking and cleaning stations.

On the other hand, by eliminating the costs of drivers, inexpensive autonomous taxi services may be cheap enough that many households reduce their vehicle ownership, and rely on a more diverse set of transport options including more walking, bicycling, public transit, ridesharing, and telework. This could reduce total parking demand, and allow vehicles to park at remote locations.

Evaluating Potential Parking Management Strategies

This process started by considering a wide range of potential management strategies, as summarized in Exhibit 3. These were reviewed by community organizations, including the BRZ and BOWDA, local businesses and residents, a public open house and presentation, and evaluated based on their ability to address parking problems in ways that are efficient and consistent with other planning goals.

Exhibit 3   **Potential Parking Management Strategies**

Strategy	Description
Shared parking	Parking spaces serve multiple users or destinations, including sharing rather than assigning reserved spaces to users, and sharing facilities among multiple destinations.
Parking regulations	Regulations that favor higher-value uses such as service vehicles, deliveries, customers, quick errands, and people with special needs.
More accurate and flexible standards	Parking standards are adjusted to more accurately reflect demand in a particular situation taking into account various geographic, demographic and management factors.
Remote and intercept parking	Provide offsite parking facilities, and encourage their use. Encourage people to keep vehicles parked at visitor accommodation.
Smart Growth/ New Urbanism	Encourage more compact, mixed, multi-modal development, which encourages sharing of parking facilities and use of alternative modes.
Walking and cycling improvements	Improve walking and cycling conditions to expand the range of destinations serviced by a parking facility and reduce automobile trips.
Encourage alternative modes	Encourage walking, bicycling, ridesharing and public transit with strategies such as commute trip reduction and school transport management programs.
Parking pricing	Charge motorists directly for using parking facilities, with efficient prices that include lower rates during off-peak periods and higher rates during peak times and locations.
Improve pricing methods	Use better charging techniques to make pricing more convenient and cost effective.
Financial incentives	Parking cash-out or transit benefits as an alternative to parking subsidies.
Unbundle parking	Rent or sell parking facilities separately from building space.
Bicycle facilities	Provide bicycle storage and changing facilities.
Support Strategies	
Improve user information and marketing	Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication.
Improve enforcement	Ensure that parking regulation enforcement is efficient, considerate and fair.
Transportation management associations	Establish member-controlled organizations that provide transport and parking management services in a particular area.
Overflow and special event parking plans	Establish plans to deal with periods of peak parking demand, such as special during events.
Parking facility design and operation	Improved parking facility design and operations to help solve problems and achieve parking management objectives.
Contingency-based planning	Responds to uncertainty by Identifying potential responses that can be deployed if needed in the future.

Parking management can include many strategies that result in more efficient use of parking resources.

Several factors were considered when determining which strategies to include in the integrated parking management plan, including the their effectiveness at solving parking problems, ease and costs of implementation, and whether they provide co-benefits and support strategic planning objectives. The table below indicates typical reductions in in the number of parking spaces needed to provide a given level of service, and whether each strategy also reduces total vehicle traffic, and therefore provides benefits such as reduced traffic congestion and pollution emissions, and increasing community livability.

Exhibit 4   **Typical Reductions in Vehicle Traffic and Parking Requirements**

Strategy	Typical Parking Demand Reductions	Traffic Reductions
Shared parking	10-30%	
Parking regulations	10-30%	
More accurate standards	10-30%	
Remote (Intercept) parking	10-30%	
Smart Growth/New Urbanism	10-30%	✓
Walking and cycling improvements	5-15%	✓
Encourage alternative modes	10-30%	✓
Parking pricing	10-30%	✓
Improve pricing methods	NA	✓
Financial incentives	10-30%	✓
Unbundle parking	10-30%	✓
Bicycle facilities	5-15%	✓
Improve user information	5-15%	✓
Improve enforcement	NA	
Transportation management associations	NA	✓
Overflow parking plans	NA	
Address spillover problems	NA	
Parking facility design	NA	
Contingency-based Planning	NA	

This table indicates typical reductions in parking requirements compared with conventional practices, and whether a strategy reduces vehicle traffic, thereby providing additional benefits.
NA = Not Appropriate, indicating strategies that do not directly affect parking requirements.

Many of these strategies have synergistic effects (total impacts are greater than the sum of their individual impacts), and so become more effective if implemented together. For example, sharing parking and walkability improvements may each reduce parking requirements just 10% if implemented alone, but 25% if implemented together because they are complementary. As a result, it is generally best to implement parking management as an integrated program that maximizes benefits and minimizes potential problems.

Under the old paradigm, parking planning was static and rigid: the planning process used zoning codes or parking generation reports to determine the minimum number of parking spaces that a development would need during its lifetime. The new paradigm is more dynamic and responsive: it strives to supply the optimal number of parking spaces needed, and respond to changing demands, using performance indicators to identify problems and test solutions. It considers a broader range of planning objectives besides parking convenience.

Based on a review of the Town's strategic planning documents and stakeholder consultations, we identified the following planning goals that should be considered with evaluating potential parking management strategies:

- Attractive and livable Town Centre, that serves as the commercial and cultural heart of the community.

- Reduce traffic problems and encourage walking, bicycling and public transit use.

- Economic development (increased business activity, employment and tax revenues).

- Improved motorist convenience (ease of finding a parking space close to destinations).

- Support environmental goals including openspace preservation, resource conservation, reduced noise and air pollution, and reduced impervious surface area.

- Financial savings and affordability.

Exhibit 5 summarizes performance targets that can be used to evaluate the effectiveness of parking management programs. This framework can evolve over time if needed to address additional planning objectives and targets.

Exhibit 5 **Performance Targets and Data Needs**

Performance Targets	Data Needs
Parking occupancy rates should not usually exceed 85% on a commercial street or parking lot, so motorists can usually see an unoccupied space when they want one.	Peak-period parking occupancy surveys for each area.
Travellers (commuters, shoppers, tourists, etc.) should have convenient information on their travel and parking options available when they are making parking decisions.	Traveller surveys. Review the content of commonly-used traveler information resources (visitor maps, brochures, websites, etc.).
Municipal parking facilities should recover their costs or generate revenue.	Parking facility return on investment analysis.
The portion of Town Centre land devoted to parking will decline in the future, in support of efforts to enhance and redevelop the area, and improve mobility options.	Town mapping. Parking supply surveys.
Developer parking costs and subsidies will be minimized.	Economic analysis. Consultation with developers.
Spillover parking problems are minimized.	Parking complaints and violation rates.
Travellers will have positive travel and parking experiences when visiting Canmore, even during busy periods.	Traveller surveys.

This parking management plan should try to achieve these objectives, based on these performance indicators.

This information can be tracked and reported regularly. For example, the Town could produce annual reports indicating where and when public parking facilities exceed 85% occupancy rates, and when and where spillover parking complaints occur.

Prioritizing Parking

In most communities, including Canmore, parking problems are concentrated at various times and locations, particularly the most convenient parking spaces on or near Main Street, during peak periods such as summer weekends and special events. Parking management involves prioritizing use of these facilities, so the most convenient parking spaces are managed to give priority to the most urgent and important trips.

Exhibit 6 illustrates this concept. It indicates which types of trips should park in various types of parking facilities. For example, it indicates that Main Street parking should be managed to favor deliveries, short errands, drop-off and pick-ups, and people with mobility impairments. Other trips should be encouraged to park at less convenient locations, including off-street Town Centre lots, and "remote" (also called "intercept" parking lots outside the Town Centre. This prioritization should vary depending on total parking demand and therefore the severity of parking problems: during off-peak periods, customers may be able to park on Main Street, and commuters and all-day visitors may be able to park in Town Centre lots, but during the summer peak, customers should be encouraged to use off-street parking, and all day parkers should be encouraged to use remote lots.

Exhibit 6   **Prioritizing Use of Parking Facilities**

Trip Types	Main Street	Other Central Streets	Town Center Lots	Remote Lots	Private Lots
Deliveries (15 min)		✓			
Short errands, drop-off and pick up (15 min)	✓	✓			
People with mobility impairments	✓	✓	✓		
Peak-season customers (2-4 hours)		✓	✓	✓	✓
Off-peak customers (2-4 hrs)	✓	✓	✓		
Peak-season all-day visitors (all day)				✓	✓
Off-peak all-day visitors (all day)				✓	✓
Peak-season commuters (all day)				✓	✓
Off-peak commuters (all day)			✓	✓	✓
Multi-day visitors (overnight)				✓	✓
Residents		✓			✓
Park & Ride transit customers (all day)			✓	✓	

Parking management involves determining where motorists should park for various types of trips, giving priority to those that are shorter duration and higher priority, particularly during peak periods.

This framework can help guide specific parking management strategies such as regulations, pricing, improved user information, and improvements to alternative modes: they should be designed and coordinated to favor higher value users in the most convenient parking spaces, and encourage less urgent users to use the less convenient parking spaces or shift to non-auto modes.

Recommendations

Based on this review and community consultation we recommend the following strategies.

Encourage Shared Parking

Shared Parking means that parking spaces serve multiple users or destinations. This can include:

- *Curb parking.* Curb parking is generally the most visible and convenient type of parking, and can serve multiple destinations. Efficient sharing requires policies that favor higher value uses (deliveries and passenger drop-off, errands, etc.) and maximize the destinations served by each space.

- *Sharing Within a Parking Lot.* Motorists share parking spaces rather than being assigned reserved spaces. For example, 100 employees can usually share 60-80 spaces since at any time some are on leave or in the field, commuting by alternative modes or working off-peak shifts. It can be optional, for example, motorists could choose $60 per month for a shared space or $100 for a reserved space.

- *Share Parking Among Destinations.* Parking can be shared among multiple destinations. For example, an office building can share parking with a restaurant or theater, since their peak demands differ.

- *Remote Parking* (also called *Satellite* or *Intercept* parking) refers to the use of cheaper or free off-site parking facilities, sometimes located at the periphery of a business district or other activity center.

- *Public rather than private parking.* Public parking, provided by governments or commercial operators, is more suited to sharing than private, on-site parking. "In lieu fees" mean that developers help fund public parking facilities instead of on-site facilities.

Exhibit 7 summarizes typical requirements for implementing shared parking.

Exhibit 7   Shared Parking Implementation Requirements

Type	Description	Implementation Recommendations
Curb parking	Efficient curb parking management	Regulate and price on-street parking to favor higher-value uses (such as deliveries and short-term)
Within a parking facility	Spaces are shared by a group rather than assigned to individuals.	Reduce parking requirements. Allow multiple users to share spaces, with a plan for addressing overflows.
Between destinations	Parking facilities serve multiple destinations.	Establish sharing agreements between destinations with different peak periods. Improve walkability and wayfinding between parking facilities and destinations.
Remote parking	Rely on cheaper off-site and remote parking.	Identify and allow use of remote parking. Improve pedestrian access and wayfinding.
Public rather than private parking	Rely on government or commercial parking, rather than private on-site parking.	Reduce parking requirements in compact, mixed-use areas. Maintain municipal lots or encourage commercial parking operators. Improve walkability and wayfinding.

There are many ways to share parking with various implementation requirements.

Shared parking impacts depend on circumstances, with higher rates in areas with more compact and mixed development. It can often reduce parking requirements 10-30% compared with all parking demands served on-site, particularly in dense and mixed use areas where many parking spaces are available within convenient walking distances.

Many other strategies described in this report support parking sharing, including reduced and more flexible parking requirements, use of remote parking facilities, walkability improvements between parking facilities and destinations, and development of a transportation management association that could maintain a database of Town Centre area parking spaces, with information on their current management and use, that can help identify opportunities for sharing.

Optimize Parking Regulations

Parking regulations control who and when vehicles may park in order to prioritize use, increase turnover, and address spillover problems. Exhibit 8 summarizes examples. Canmore currently regulates municipal parking in the Town Centre and nearby neighborhoods, but these can be expanded and adjusted over time to support the integrated parking management program.
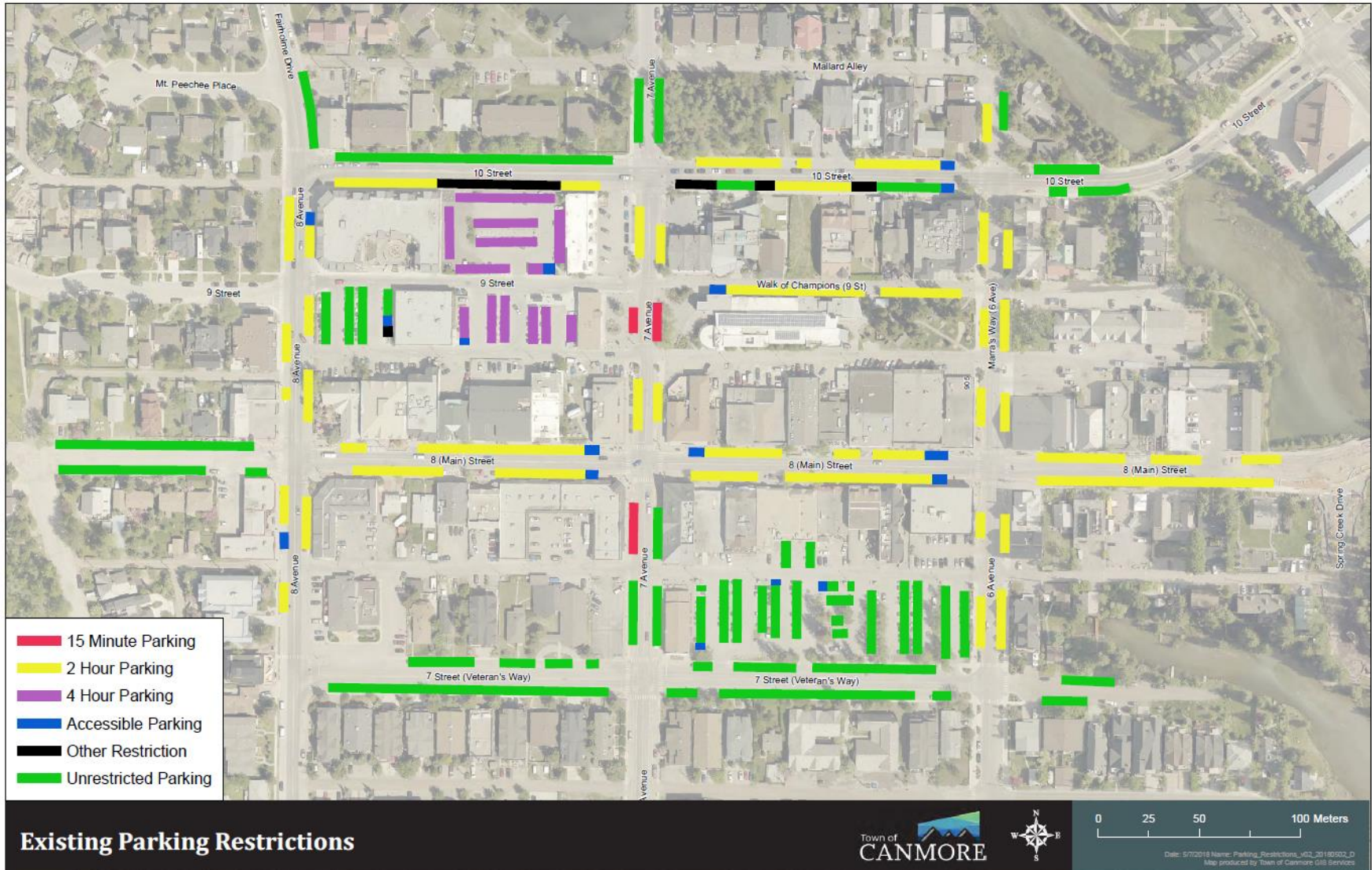
Exhibit 8   **Common Parking Regulations**

Name	Description	Favored Activity
User or vehicle type	Spaces dedicated to loading, service, taxis, customers, rideshare vehicles, disabled users, buses and trucks.	As specified
Duration	Limit parking duration (5-minute loading zones, 30-minutes adjacent to shop entrances, 1- or 2-hour limits).	Short-term users, such as deliveries, customers and errands.
Time period restrictions	Restrict times, such as before 10 am to discourage commuters or 10 pm to 5 am to discourage residents.	Depends on restrictions.
Employees	Prohibit employees from using the most convenient spaces.	Customers, deliveries and errands.
Special events	Have special parking regulations during special events.	Depends on restrictions.
Special use parking	Provide special parking passes or reserved spaces for delivery, service and construction vehicles.	Vehicles used for specified purposes.
Residential permits	Use Residential Parking Permits (RPPs) to give area residents priority use of parking near their homes.	Residents.
Street cleaning restrictions	Regulations that prohibit parking on a particular street one day of the week to allow street sweeping.	Street cleaning. Insures vehicles are moved occasionally.
Large vehicle restrictions	Limit on-street parking of large vehicles, such as RVs and trailers.	Normal-size vehicles.
Arterial lanes	Prohibit on-street parking on arterials during peak periods.	Vehicle traffic.
Abandoned vehicles	Identify and remove abandoned vehicles from public parking facilities.	Operating vehicles.

Various regulations can manage parking for efficiency and prevent problems.

More efficient regulations can often reduce the number parking spaces needed to serve an area by 10-30%, and supports other parking management strategies by addressing spillover problems. These regulations should be reviewed regularly to ensure that they are consistent with the area's strategy planning goals, with mechanisms to adjust them as needed.

Exhibits 9 and 10 illustrate existing and proposed parking regulations. The proposed regulations provide 15-30 free minutes to accommodate short errands, and vary by season to reflect changing demands. These should be reviewed and adjusted in the future based on their measured impacts.

Exhibit 9   Existing Parking Regulations

This figure illustrates existing Town Centre parking regulations.

Exhibit 10 **Proposed Parking Regulations and Pricing**
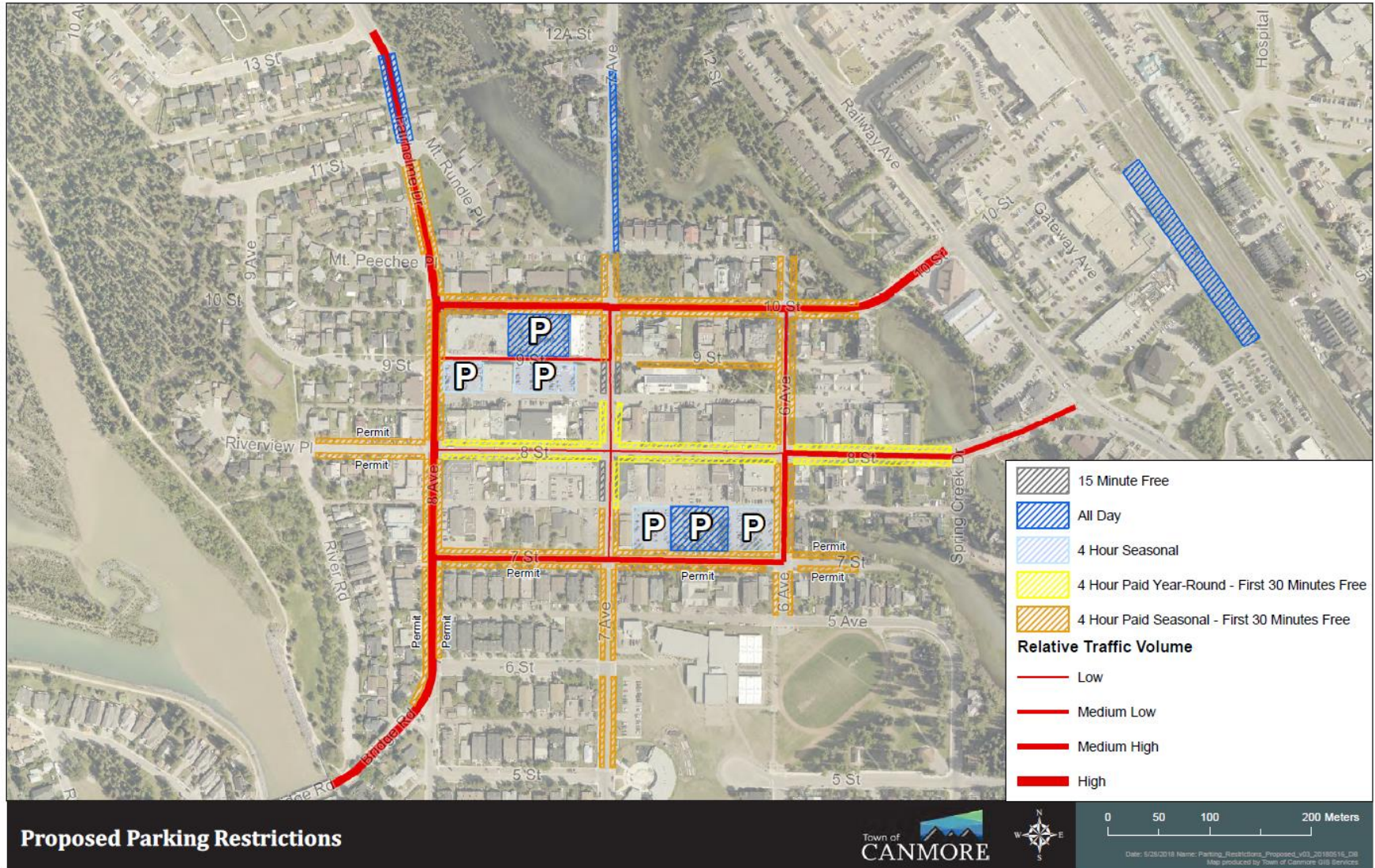
This figure illustrates proposed Town Centre parking regulations and pricing.

Reduced and More Accurate Parking Requirements

Like most municipalities, Canmore requires a certain number of on-site parking spaces, and in some cases, cash-in-lieu fees that developers may pay as an alternative to providing their own parking. These standards are generally based on generic parking generation studies or surveys of similar communities. The process used to develop these standards often results in oversupply. For example, a parking lot is usually considered full if it has 85% or more occupancy, and parking lots are designed for the 10th or 20th annual design-hour (the maximum number of annual hours that a parking facility should be full). As a result, most parking lots are seldom full, and many parking lots are never full. These requirements seldom reflect demographic, geographic and management factors that affect parking demands.

Canmore should critically evaluate existing parking requirements, with the goal of reducing them when possible, and making them accurately reflect actual parking demands. It could commission a study of factors that affect parking demands, and use the results to develop adjustment factors, or adopt a generic set of adjustment factors, such as Exhibit 11. Since the Town Centre is relatively dense, mixed and walkable, those adjustment factors would apply to any development there. In addition, parking requirements would be reduced if residential developments are for employee housing, PAH, or otherwise lower income; if developments have on-site carsharing; if employers have Commute Trip Reduction programs; where parking is priced, unbundled or cashed out; where there are overflow parking options nearby, or if there is a contingency-based plan for addressing possible future shortages.

Exhibit 11   **Minimum Parking Requirement Adjustment Factors**

Factor	Recommended Adjustments
Residential Density	Reduce requirements 1% for each resident per acre.
Employment Density	Reduce requirements 10-15% in areas with 50+ employees per gross acre.
Land Use Mix	Reduce requirements 5-10% in mixed-use areas, and more if parking can be shared.
Carsharing	Reduce residential requirements 5-10% if a carsharing service is located nearby, or 4-8 spaces for each carshare vehicle in a residential building.
Walkability	Reduce requirements 5-15% in walkable communities, and more if walkability allow more shared and off-site parking.
Income	Reduce requirements 10-20% for the 20% lowest income households, and 20-30% for the lowest 10%.
Pricing	Reduce requirements 10-30% for cost-recovery pricing (revenues pay parking facility costs), unbundling (parking rented separately from building space) or cashed out (commuters who do not drive are offered benefits equivalent to parking subsidies.
CTR program	Reduce requirements 10-40% at worksites with Commute Trip Reduction programs.
Proximity to overflow options	Reduce requirements 10-20% if overflow parking options are available nearby.
Contingency-Based Planning	Reduce requirements 10-30%, and more if contingency-based parking management allows developers to minimize their parking supply.

Adjustment factors rationalize parking requirements and give property owners an incentive to implement management strategies that reduce parking demands.

Reduce In-Lieu Parking Fees

Canmore allows Town Centre developers to pay cash-in-lieu fees as an alternative to building on-site parking. The current fee is $40,000 per space, which was estimated to reflect 80% of the cost of a structured parking space. This is a major financial burden which discourages Town Centre development, and is more than actually justified for Town Centre businesses, since relatively few employees and customers require nearby parking, and parking spaces serve multiple destinations so their costs should be shared. Assuming that parking generation rates are about half in the Town Centre as to other destinations, and each Town Centre parking space serves 2-4 destinations, fees can be reduced from $40,000 to $5,000-10,000 per space ($40,000 x 0.5 = $20,000; $20,000 x 0.25-0.5 = $5,000-$10,000).

Develop Remote (Intercept) Parking

Canmore's Town Centre is surrounded by abundant parking supply. The Town can encourage motorists to park in these remote lots in the following ways:

- Survey and map existing and potential remote parking options, including parking facilities at nearby hotels, schools, parks, etc.

- Provide information that encourages motorists to park at these locations, using websites, maps, roadway signs, and information on tourist and special event promotion. Encourage or require special event organizers to direct participants to those areas.

- Encourage hotel occupants to leave their vehicles and walk, bike or bus downtown, rather than drive. Encourage hotels to provide rental bikes and shuttle bus services for local travel.

- Redesign tourist maps and brochures to highlight remote parking options, and the paths and bus services to the Town Centre. Encourage visitor services workers (hotel staff, tourist information office clerks, etc.) to promote remote parking.

- Improve paths between remote parking and the Town Centre to include attractions such as interactive artworks, interpretive signs, playgrounds and other amenities, brand them (the *Art Walk*, the *Heritage Trail*, the *Play Route*, etc.) and promote their use as part of the visitor experience (Roper 2018).

- Provide wayfinding signs that guide visitors by foot from remote parking to common destinations, with information on the time required to reach them and attractions along the way.

- Consider providing and promoting shuttle-bus services between remote parking and common destinations during peak-periods.

- Install signs in Town Centre parking lots which say, "Additional parking available at…" with maps and arrows indicating directions.

Improve Walking and Bicycling Conditions

Canmore is implementing substantial pedestrian and bicycling improvements (well done!). For parking management, special analysis should examine possible obstacles to walking and bicycling between parking facilities and Town Centre area destinations, and if any are identified, implemented targeted improvements. For example, give special attention to the quality of sidewalks, crosswalks and paths between remote parking, motels, other commercial areas, and bus stops, and the Town Centre. Exhibit 12 identifies potential walking routes that could be developed and promoted as an enjoyable experience, which also help reduce Town Centre parking demands. Bicycle sharing services can also help some people travel car-free and leave their vehicles parked at the Town Centre periphery.

Legend
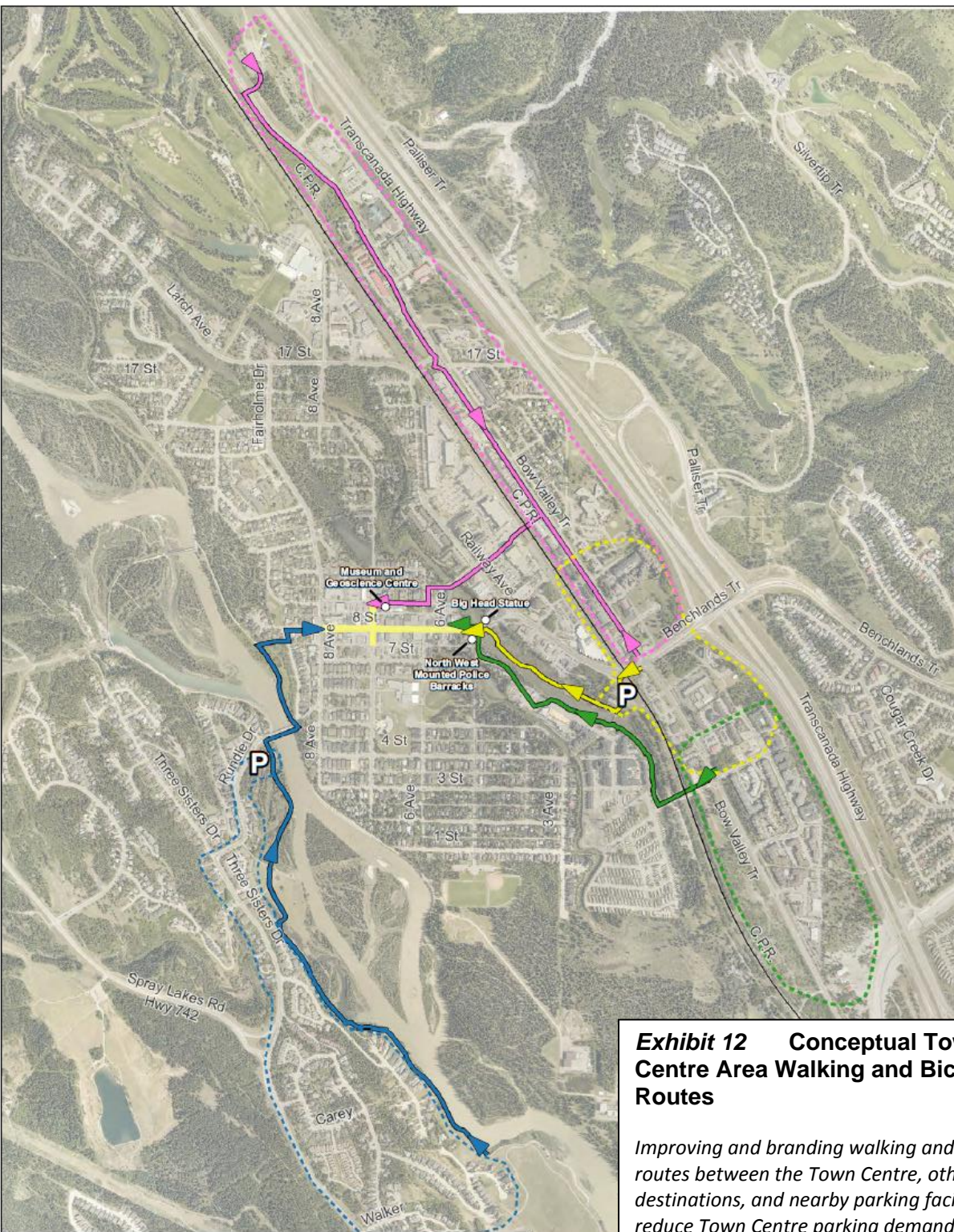
- #1 Heritage Walk - 0.7-2.6 Km (5-35 Minutes)
- #2 Policeman's Creek Boardwalk - 0.8 Km (12 Minutes)
- #3 Riverside Walk - 0.7-2.5 Km (10-40 Minutes)
- #4 Spring Creek Walk - 1.3 Km (20 Minutes)
- Town Centre
- Walking Tour Catchment Areas

Town Centre Scenic Walks

Town of CANMORE

Exhibit 12 **Conceptual Town Centre Area Walking and Bicycling Routes**

Improving and branding walking and bicycling routes between the Town Centre, other destinations, and nearby parking facilities can reduce Town Centre parking demands and help create an attractive amenity for visitors and residents.

Proposed walking and bicycling routes include a Heritage Walk, Policeman's Creek Boardwalk, Riverside Walk and Spring Creek Walk.

These routes can include art works, play areas, nature and historic interpretive signs, making walking and bicycling an enjoyable activity, as well as promoting more efficient travel and parking.

Encourage Alternative Modes

Canmore is already implementing policies and programs to encourage walking, bicycling, ridesharing, taxi and public transit travel, and in the future it could encourage development of ride-hailing, and bike- and car-sharing services. These efforts can be targeted to help reduce Town Centre parking problems. Some other strategies described in this report, such as Commute Trip Reduction programs and a Town Centre Transportation Management Association, provide an institutional framework for implementation.

Canmore has recently started a local transit service and use is expected to grow over time as routes and stops are improved and service is increased. Reducing or eliminating transit fares can further encourage workers and visitors to use public transit. Subsidized transit passes or fare-free transit can increase transit ridership by 20% to 60%, and provides an attractive amenity to residents and visitors (Volinski 2012). Since Canmore's transit system has low farebox cost recovery, eliminating fares would only reduce annual revenue approximately $85,000, or $30,000 for peak summer months. This is a cost that could be recovered through parking facility savings or new parking fees.

Parking Pricing

Efficient parking pricing means that users pay directly for parking facilities in order to manage demand, encourage turnover and generate revenue. Public parking is currently unpriced in Canmore, but the parking is not actually free, residents and visitors pay indirectly through higher taxes and rents. Paying directly is more efficient and fair because it does not force consumers to pay for parking spaces they do not demand, and so gives people a new opportunity to save money when they reduce their vehicle ownership and trips, or shift to a parking space with lower demand. If Town Center parking were priced, an estimated 80% of revenue would be paid by visitors, which would help finance the municipal services and facilities they use, including parking facilities, traffic management and sidewalks.

Parking pricing is one of the most effective ways to encourage more efficient parking and vehicle travel. Compared with unpriced parking, cost-recovery parking typically reduces affected parking demand and vehicle trips by 10-30%, and sometimes more if implemented in conjunction with alternative mode improvements (walking, bicycling, ridesharing and public transport).

Efficient pricing should reflect these principles:

- As much as possible, charge users directly rather than indirectly for parking in order to efficiently manage demand, encourage use of alternative modes, and generate revenue.

- Set prices to maintain optimal demand, such as 80-90% maximum peak period occupancy. Establish methods to adjust prices as needed to achieve these targets.

- Charge higher rates and use shorter pricing periods for more convenient parking spaces, to favor higher-priority uses and increase turnover. For example, charge 50¢ per 15-minutes at convenient locations, and $1.00 per hour at less convenient locations. Adjust prices as needed to optimize use.

- Use convenient and efficient payment systems which allow various payment options (coins, bills, credit and debit cards, and pay-by-phone) and only charge for the amount of time a vehicle is parked.

- *Unbundle parking*. Encourage or require landlords to rent parking separately from building space; for example, rather than paying $1,200 per month for an apartment with two parking spaces, pay $1,000 per month for the apartment plus $100 per month for each space they want to use.

- *Cash-out free parking*. Encourage or require employers to provide non-drivers with financial benefits equivalent in value to any parking subsidies they provide to those who drive.

- Dedicate the revenue to a *Town Centre Parking Management and Enhancement Fund*.

Responding to Criticisms

Parking pricing can be controversial. Critics tend to focus on costs and overlook many community benefits. Below are possible responses to common criticisms.

- Parking is not free. Residents, businesses and visitors pay indirectly through higher taxes, higher rents, and increased costs of goods and services.

- Pricing is the most effective way to reduce parking problems. It improves user convenience by ensuring that motorists can always find a convenient parking space, even during peak periods in areas with high demand.

- Only applies on a few streets and perhaps lots with the most severe parking problems.

- First 15-30 minutes are free.

- Is seasonal. Prices are reduced during off-peak months.

- Free parking is available a short walk away.

- Revenues benefit residents and the streets they are collected on, such as funding fare-free transit and Town Centre enhancement.

- Most revenue (estimated 80%) will be paid by visitors.

- Allows motorists to pay a portion of the road and parking facility costs they impose.

- It can be tested and changed. Public support tends to increase after efficient pricing is introduced and residents experience the benefits.

Bicycle Parking and Amenities

Bicycle parking is a vital support for bicycle transportation. The 2018 Parking Study identified that a lack of bicycle parking in the Town Centre contributes to overflow parking against trees and railings. Further, much of the bicycle parking that does exist is on sidewalks. This takes up valuable public space and encourages cycling on sidewalks.

Canmore has worked to increase the number of bicycle parking stalls over the past five years, with approximately 300 new public and private bicycle parking locations in and around the Town Centre. It is recommended that additional bicycle parking is added in the Town Centre in locations near ramps at the ends of blocks and in bicycle corrals mid-block to increase coverage and convenience. Bicycle parking should not be located in the direct path of sidewalk users.

Bicycle parking should meet APBP standards. For new developments, secure bicycle parking and change facilities can encourage more trips by staff by bicycle.

The attached mapping illustrates coverage and locations where on-sidewalk bicycle parking is located.

Exhibit 13   Bicycle Parking Coverage

Legend:
- Off Sidewalk Bike Rack
- On Sidewalk Bike Rack
- Off Sidewalk Bike Rack Service Area Buffer
- On Sidewalk Bike Rack Service Area Buffer
- Building Footprint

Notes: Labels show bicycle capacity for each rack

Rack Buffer Distances
1-3 bicycle capacity: 5m
4-5 bicycle capacity: 10m
>5 bicycle capacity: 25m

Bicycle Parking

Town of CANMORE

0   25   50   100 Meters

Date: 6/6/2018 Name: Bicycle_Parking_vG2_20180606_DB
Map produced by Town of Canmore GIS Services

Improve User Information

A key component of this Plan is to improve the information available to travelers concerning travel and parking options, at the times they are making these decisions. This can generally be incorporated into existing information resources. For example, numerous brochures, maps and websites provide Canmore visitor information. Although most describe local hiking and bicycling trails, and some provide public transit information, but they currently provide little practical guidance on where to park and how to minimize driving when visiting the area.

Improved user travel and parking information can include:

- Information on websites and other visitor information concerning travel and parking options, highlighting ways to visit by non-auto modes, and encouraging visitors and staff to use remote rather than Town Centre parking.

- Roadway signs that encourage use of remote parking options.

- Tourist maps that identify travel and parking options, highlighting remote parking.

- Wayfinding signs which highlight walking options between parking and local attractions.

- Information and training to tourist-industry workers and volunteers concerning where visitors should park and how they can travel to local destinations.

Improve Enforcement

To be effective and politically acceptable, parking enforcement must be efficient, considerate and fair. The need for citations should be minimized by providing adequate user information and options. For example, motorists sometimes violate parking regulations simply out of ignorance, because they lack the denomination required by a parking meter, or because a meeting took longer than expected. Better user information and newer pricing methods can help address these problems, reducing violations. It may be appropriate to have exemptions to parking regulations and fines, such as "First Time Free," so the first time a motorist violates parking rules they are given information about parking regulations instead of a citation.

Parking Management Working Group

In lieu of a Transportation Management Association, a Parking Management Working Group that includes Town officials and representatives of local businesses and community groups can help guide implementation of parking management strategies and help allocate pricing revenues.

Overflow Parking Plans

Overflow parking plans describe the management strategies that will be implemented when parking demand exceeds available supply, for example, during special events, peak shopping periods, or temporary parking facility closures. This can include use of off-site parking facilities, special transport services, user information (signs, maps, websites) indicating the location of overflow parking facilities, commute trip reduction programs to encourage employees to reduce use of central area parking facilities, and sometimes pedestrian improvements or shuttle bus services between off-site parking and destinations. Overflow parking plans can significantly reduce the need to oversupply parking in order to accommodate occasional peaks. Impacts vary depending on the degree that parking is oversupplied to address occasional peak demands. Canmore can also encourage or require special event organizers to develop transport and parking management plans.

Address Spillover Problems

Spillover parking problems refers to the undesirable use of offsite parking facilities, such as when business customers and employees park on nearby residential streets or use another businesses' parking lot. Concerns about spillover impacts are often used to justify excessive parking requirements and oppose management solutions such as regulations and pricing. Addressing spillover problems can increase parking management program acceptability and effectiveness.

There are several ways to address spillover parking problems:

- Provide information indicating where motorists may and may not park.

- Use regulations and pricing to control spillover impacts, such as time limits, parking meters and permit programs on residential streets near activity centers.

- Compensate people who bear spillover parking impacts. For example, a high school can send complementary sport event tickets to residents of nearby streets who experience spillover parking problems.

- Establish a monitoring program to identify where parking spillover is a problem. This may include frequent parking surveys, and ways for residents and businesses to report spillover problems.

Canmore should continually review and adjust its protocols for addressing spillover parking problems in both public and private parking areas. Exhibit 14 illustrates proposed parking management zones. The Town Center Zone should include a variety of parking management strategies to encourage sharing, prioritization and turnover. The Residential Zone should favor residents over visitor parking, and be monitored to determine if spillover parking problems develop.

Exhibit 14   Proposed Parking Management Zones

Proposed Parking Management Zones

Residential Parking Management Zone

Town Centre & Gateway Parking Management Zone

Town of CANMORE

0   125   250   500 Meters
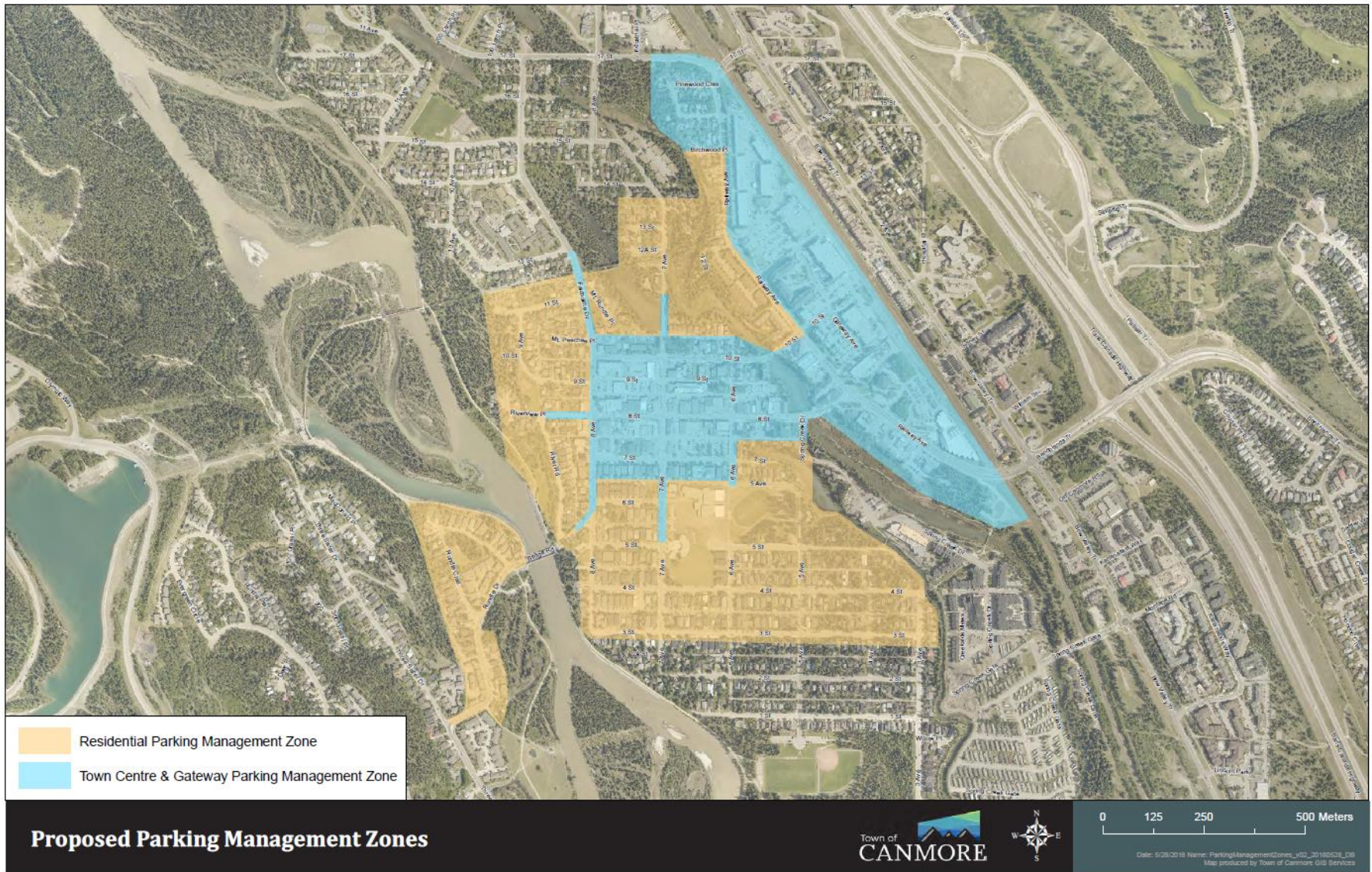
Contingency-Based Planning

Parking demands tend to change over time, and various parking management strategies can be used to address possible future supply shortages. Contingency-based planning means that developers can build relative few parking spaces, provided that they have a plan which identifies how they will respond if that supply turns out to be inadequate sometime in the future. Contingency-base planning shifts the burden of proof for parking supply reductions: current practices place a high burden of proof contingency-base planning allows any reasonable reduction provided that it includes a plan which indicates how parking shortages will be managed.

Canmore can allow or encourage contingency-based plans when negotiating parking requirements for new developments. For example, if the zoning code would require 50 parking spaces for a particular building, but the developer believes that only 30 are actually needed, contingency-based planning would allow construction of just 30 provided that the developer produces a contingency plan which identifies how the building operators would respond if that is insufficient and neighbors complain about spillover parking problems. That plan might include some combination of increasing parking supply by paving over a lawn or building a parking structure, renting or sharing nearby offsite parking, encouraging residents to reduce their vehicle ownership through on-site carsharing or subsidized transit and ride-hailing fares, encouraging commuters to use non-auto modes, pricing currently free parking, or imposing restrictions on parking. This plan can include *triggers* (for example, the plan must be implemented if the city receives complaints of spillover parking problems from more than four neighbors in a year), *phases* (a certain set of strategies are implemented first, if those are insufficient additional strategies are also implemented) and *penalties* (if the plan fails the city imposes fines).

Conclusions and Recommendations

Like most attractive and economically successful communities, Canmore has parking problems, particularly in the Town Centre during peak periods. More efficient parking management can help solve these problems in ways that support other community goals.

Based on a review of potential parking management strategies and community consultations, this project identified a set of parking management strategies that can help reduce these problems in ways that are cost effective and consistent with other strategic planning goals. Exhibit 15 summarizes them.

Exhibit 15   **Potential Parking Management Strategies**

Strategy	Description
Remote (intercept) parking	Encourage motorists to park in remote intercept lots when possible.
Encourage alternative modes	Encourage walking, bicycling, ridesharing, ridehailing, taxi and public transit travel, particularly where it can help reduce parking problems.
Shared parking	Encourage the efficient sharing of parking facilities.
Optimize parking regulations	Use regulations to prioritize use, increase turnover, and address spillover problems.
Reduced and more accurate parking requirements	Critically evaluate Town Centre parking requirements, with the goal of reducing them when possible, and making them accurately reflect actual parking demands
Reduce in-lieu fees	Reduce cash-in-lieu fees to reflect low auto mode shares and high rates of shared parking in the Town Centre area.
Walking and cycling improvements	Continue to improve active travel conditions, with special consideration to connections between parking facilities and Town Centre area destinations.
Parking pricing	Price Town Center parking in order to manage demand, encourage turnover and generate revenue
Improve user information and marketing	Improve the information available to travellers concerning travel and parking options, at the times they are making these decisions.
Improve enforcement	Continually review parking enforcement practices to ensure that they are efficient, considerate and fair.
Transportation management association (TMA)	Develop a TMA or Parking Management Working Group to support parking and transportation management programs and allocate revenue.
Overflow and special event parking plans	Encourage or require special event organizers to develop transport and parking management plans
Address spillover problems	Continually review and adjust protocols for addressing spillover parking problems.
Contingency-based planning	Allow or encourage contingency-based parking planning.

Canmore's integrated parking management plan includes these strategies.

These strategies work together to ensure that the most convenient parking spaces (those on or near Main Street) are available to higher-value uses, such as deliveries, pick-up and drop-off, short errands and vehicles carrying people with mobility impairments, particularly during peak periods. This means that when performing an urgent or quick errand, motorists can almost always find an available parking space, even in the Town Centre during busy seasons, that other types of trips are accommodated elsewhere, and travellers have the information they need when making travel and parking decisions.

Most of these strategies are already being implemented to some degree in Canmore, but this plan supports more coordinated and targeted implementation. For example, effort to share parking and encourage non-auto commute modes, and provide targeted information on transport and parking options, can become more effective and efficient coordinated by a Town Centre Working Group, and targeted at the times and areas where parking problems are most severe.

This planning process should be dynamic, responsive to changing community needs and program outcomes. Specific performance indicators, such as those in Exhibit 5, should be defined and data collected in order to evaluate progress and identify potential problems. For example, if an area frequently experienced parking occupancy rates that exceed the 85% maximum, or spillover parking problems, additional management strategies should be implemented there. If some parking management strategies prove more effective than others, the effective ones should be expanded and the less effective ones reduced.

If implemented as an integrated program these strategies should reduce parking problems at a lower costs than would be required to build more Town Centre area supply, while also helping to achieve other community goals such as reducing traffic congestion, support local economic development, making the Town Centre more attractive, improving affordability, and increasing public health.

References

Boulevard Transportation (2016), *Bylaw Comparison + Best Practices*, City of Victoria Off-street Parking Review (www.victoria.ca/EN/main/residents/planning-development/off-street-parking-review.html); at http://bit.ly/2uZXwbA.

Boulevard Consulting (2016), *Parking Demand Assessment*, Working Paper #3, Review of Zoning Regulation Bylaws, City of Victoria (www.victoria.ca); at http://bit.ly/2tA4CAw.

Canmore (2012), *Land Use Bylaw*, Town of Canmore (https://canmore.ca); at https://canmore.ca/documents/209-section-4-general-regulations.

Angela DeLuca (2018), *Ending the Search for Parking*, Urbanism Next (https://urbanismnext.uoregon.edu); at https://bit.ly/2q6uTWD.

John D. Edwards (2006), "The Main Street Parking Initiative," *ITE Journal*, Vol. 76, No. 11 (www.ite.org), November 2006, pp. 30-38; at http://bit.ly/2c4ADuj.

Kate Fane (2018), "Parking Spaces Will No Longer Be Just for Cars: Thanks to car-sharing and the advent of autonomous cars, cities around the world are reimagining their parking garages," *Mother Jones* (https://motherboard.vice.com); at https://bit.ly/2HW3VMk.

Robert Gibbs (2012), "Parking Demand," *Principles of Urban Retail*, John Wiley; summary at www.cnu.org/cnu-news/2013/02/robert-gibbs-principles-urban-retail-planning-and-development.

William J. Gribb (2015), "3-D Residential Land Use and Downtown Parking: An Analysis of Demand Index," *CityScape*, Vol. 17, No. 1, pp. 71-84; at www.huduser.gov/portal/periodicals/cityscpe/vol17num1/ch6.pdf.

Daniel B. Hess (2017), Repealing Minimum Parking Requirements in Buffalo: New Directions for Land Use and Development," *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, http://dx.doi.org/10.1080/17549175.2017.1310743.

King County (2011), *Right Size Parking Project* (https://bit.ly/2s10lY7).

Todd Litman (2006), *Parking Management Best Practices*, Planners Press (www.vtpi.org/PMBP_Flyer.pdf).

Todd Litman (2006), *Parking Management: Strategies, Evaluation and Planning*, Victoria Transport Policy Institute (www.vtpi.org); at www.vtpi.org/park_man.pdf.

MRSC (2016), *Downtown Parking*, Municipal Research and Service Center of Washington (www.mrsc.org); at http://mrsc.org/Home/Explore-Topics/Transportation/Parking-Management-and-Enforcement/Downtown-Parking.aspx.

Oregon Downtown Development Association (2001), *Parking Management Made Easy: A Guide to Taming the Downtown Parking Beast*, Oregon DOT and Dept. of Environmental Quality (www.lcd.state.or.us); at www.oregon.gov/LCD/docs/publications/parkingguide.pdf.

Mehdi Nourinejad, Sina Bahrami, Matthew J. Roorda (2018), "Designing parking facilities for autonomous vehicles," *Transportation Research Part B: Methodological*, 2018; 109: 110 (DOI: 10.1016/j.trb.2017.12.017)

Gregory Pierce and Donald Shoup (2013), "Getting the Prices Right: An Evaluation of Pricing Parking by Demand," Journal of the American Planning Association, 79(1): 67–81; summary at www.accessmagazine.org/wp-content/uploads/sites/7/2015/10/SFpark.pdf.

Rachel Quednau (2018), *The Parking Problem that Wasn't*, Strong Towns (www.strongtowns.org); at www.strongtowns.org/journal/2018/3/13/the-parking-problem-that-wasnt.

Red Deer (2017), *City of Red Deer Parking Management Strategy*, City of Red Dear (www.reddeer.ca); at http://bit.ly/2GOPOFt.

Eric Roper (2018), "Hopkins Prepares to Unveil Art-inspired Route for Walkers, Bikes. The redesigned corridor near Mainstreet will connect to a light-rail stop and two regional bike trails," *Star Tribune* (www.startribune.com); at http://strib.mn/2x1UB5d.

Stantec (2018), *Canmore Town Centre Parking Study*, Town of Canmore (https://canmore.ca); at https://canmore.ca/projects/parking-study.

Steven Spears, Marlon G. Boarnet and Susan Handy (2014), *Policy Brief on the Impacts of Parking Pricing Based on a Review of the Empirical Literature*, for Research on Impacts of Transportation and Land Use-Related Policies, California Air Resources Board (http://arb.ca.gov/cc/sb375/policies/policies.htm).

Ruth Steiner, et al. (2012), *Impact of Parking Supply and Demand Management on Central Business District (CBD) Traffic Congestion, Transit Performance and Sustainable Land Use*, Florida Department of Transportation Research Center (www.dot.state.fl.us/research-center); at http://tinyurl.com/n2bk6f5.

Sophie Tyler, Giles Semper, Peter Guest & Ben Fieldhouse (2012), *The Relevance Of Parking In The Success Of Urban Centres, A Review*, London Councils (www.londoncouncils.gov.uk); at www.londoncouncils.gov.uk/policylobbying/transport/parkinginlondon/parkingurban.htm.

Joel Volinski (2012), *Implementation and Outcomes of Fare-Free Transit Systems A Synthesis of Transit Practice Consultant*, TCRP Synthesis 101, Transit Cooperative Research Program; at www.nap.edu/download/22753.

Rachel Weinberger and Joshua Karlin-Resnick (2015), *Parking in Mixed-Use U.S. Districts: Oversupplied No Matter How You Slice the Pie*, Transportation Research Board Annual Meeting (www.trb.org); at http://nelsonnygaard.com/wp-content/uploads/2014/03/Oversupplied-Parking_RW_JKR.pdf.

Richard Willson (2015), *Parking Management for Smart Growth*, Island Press (http://islandpress.org); at http://islandpress.org/book/parking-management-for-smart-growth.

Appendix - Examples and Case Studies

For this study, we also reviewed parking management strategies in other, similar communities.

City of Kelowna (www.kelowna.ca/roads-transportation/parking/parking-management-strategy)
During the last five years Kelowna has developed a City-Wide *Parking Management Strategy* based on principles listed below. It lead to development of parking management plans for specific areas such as downtown and a medical district.

Kelowna Parking Management Principles

- *The City will focus on excellent short-term parking management to support higher turn-over while maintaining a governing role in long-term parking solutions.* The City's primary role in parking management should be to provide short-term public parking, including the protection of existing on-street space, with a secondary role of governing and planning for long-term parking. Pricing levels should encourage private investment in long-term parking facilities.

- *The parking system will continue to pay for itself (will operate under a user-pay cost recovery model).* There are many costs associated with parking: new infrastructure, maintenance, equipment, enforcement, upgrades, customer service applications, replacement of existing infrastructure, land acquisition, management and more.

- *Focus on customer service and fairness in parking practices by providing options, technologies and information.* Additional payment options, improved signage, fair practices and real-time information make parking more accessible, easier to find, eases (or lessens) enforcement requirements and supports active business areas and balanced neighbourhoods.

- *The City will work with institutions, businesses and developers to plan solutions for parking management.* Parking policies must support the private and institutional sectors to ensure efficient and economical ways to address parking and transportation overall. Policies should help to encourage public-private partnerships as well as private investment.

- *Parking will be used to support a balanced transportation system.* Parking is part of the larger transportation picture. Inexpensive and plentiful parking will not encourage people to use transit, walk or cycle. Strategies to manage the supply of various types of parking and pricing in some of the most vibrant areas of the city will serve to discourage single-occupant vehicles and encouraging other ways to commute.

City of Red Deer Parking Management Strategy (https://bit.ly/2GOPOFt)
The Red Deer parking management strategy is a good example of a customer-focused program that includes sometimes-overlooked features such as user security and aesthetics. It includes these objectives:

- Affordable, convenient, easy-to-locate, and easy-to-use parking options will be available through ongoing supply monitoring for on and off-street parking inventory, based on demand and relevant area/district characteristics.

- Parking utilization rates, pricing, and time restrictions will be managed to promote customer choice and to incent turnover in high-use areas, and longer stays in surface lots adjacent to areas with lower utilization rates.

- Crime Prevention through Environmental Design (CPTED) reviews of public and private parking inventory, annual safety reviews, and incident reporting processes will help to ensure a secure and appealing parking experience.

- Policies to guide the incorporation of aesthetic features into City parking facilities, and Land Use Bylaw design standards for parking facilities will contribute to the supply of appealing parking options.

- City-managed parking facilities, lots and spaces will be maintained to promote an appealing, safe and accessible parking experience.

- Wayfinding will be provided, as appropriate, to highlight connections between parking and key destinations.

- A range of payment options will be provided for users, which may include cash, credit card, parking cards, mobile apps or any future means of payment.

- Accessible parking stalls will be provided, monitored and managed so that all citizens are able to access the parking facilities they require.

New Westminster Downtown Parking Management Plan (https://bit.ly/2HZFcHO)

The Downtown Parking Strategy of this Vancouver suburb guides the long term planning and management of parking in the City's downtown core. It addresses a number of issues, including providing parking that is supportive of retail and economic vibrancy without encouraging automobile dependency. The Downtown Parking Strategy further examines existing parking supply and demand conditions in order to position the City to address and meet all future parking needs.

Exhibit Ap-1 **Parking Management Strategies**

The New Westminster Downtown Parking Management Strategy includes various components.
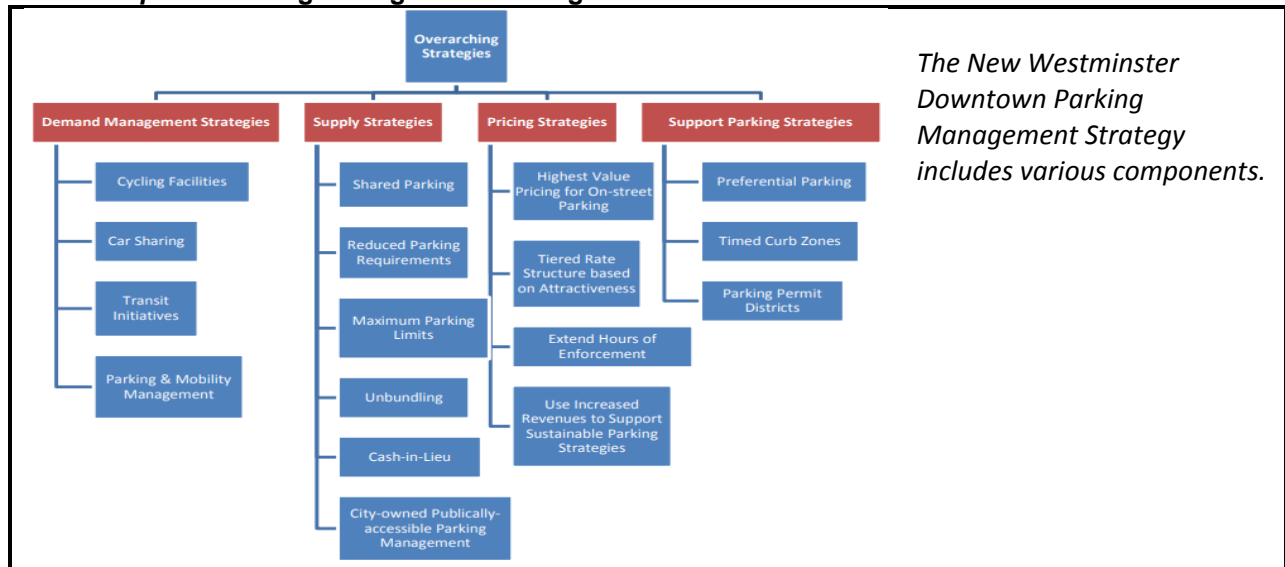
Downtown New Westminster parking is about 15% public and 85% private. This study identifies the objectives and responsibilities of each in more efficient parking management, so they are coordinated. Although the city does not directly dictate private parking pricing, operations or enforcement, it influences these factors through regulations how it manages its own parking, for example, the regulations and prices applied to on0-street parking.

Exhibit Ap-2 **Integrated Public and Private Parking Management**

	PUBLICLY OWNED		PRIVATELY OWNED	
	On-street	Off-street	Off-Street Public	Off-street Private
Planning & Policies	✓	✓	✓	✓
Bylaws & Regulations	✓	✓	✓	✓
Provision	✓	✓	x	x
Pricing	✓	✓	x	x
Operations/ Maintenance	✓	✓	x	x
Enforcement	✓	✓	x	x
Financing	✓	✓	x	x
Public-Private Partnerships	✓	✓	x	x

The city directly controls about 15% of total downtown parking supply. It influences private parking facilities through regulations, and by how it manages its own parking facilities. Coordinated planning and policies help ensure that they all support parking management goals.

The Stakeholder Advisory Group identified the following factors that would indicate program success:

- Everyone understands how parking policies relate to overall transport, economic and livability goals.
- Residents and businesses support each other, with more local use of local businesses.
- Parking is available in the right place, time and price, and people know where to find it.
- Downtown New Westminster is a unique destination.
- Businesses, residents, and students all benefit from locating together in a vibrant Downtown.
- A balance of retail with offices to increase local daytime shoppers.
- Retailers providing options to local travellers who use alternative modes.

Reducing and Eliminating Parking Requirements (http://bit.ly/2uZXwbA)
Like many older downtowns, Victoria's Central Business District had no minimum off-street parking requirements, and as a result of a 1996 community design charrette, this was expanded to include the 12-block Harris Green district. Since then, the downtown core has experienced significant economic and residential growth, and is recognized world-wide for its livability. Many developments in the area do include parking, but often much less than required elsewhere.

The City of Victoria reduced residential neighborhood parking requirements, based on a study that used vehicle registration data to determine the number of vehicles owned by residents of 126 multi-residential sites with 6,475 total units. It found:

- Overall vehicle ownership averaged 0.63 vehicles per unit, with 0.74 vehicles per condominium unit and 0.49 vehicles per apartment unit.
- Vehicle ownership among "Affordable" sites was approximately 30% lower than the average among Condominium and Apartment sites.
- Vehicle ownership averaged 0.57 vehicles per unit in Downtown Area sites, approximately 25% to 30% lower than elsewhere in the City.
- Vehicle ownership ranged from 0.31 vehicles per unit in bachelor/studio units up to 1.04 vehicles per unit among three-bedroom units.
- Visitor parking demand averaged 0.07 vehicles per unit among 16 multifamily sites.

Right-Size Parking Study (www.rightsizeparking.org)

The *Right Size Parking Project* developed practical tools for more accurately calculating residential parking demand, taking into account geographic and economic factors. The study found that parking demand per unit declines with increased transit proximity, local population and employment density, and parking price (the amount that residents must pay extra, if any, for a parking space), and increases with rents, unit size and number of bedrooms. The resulting model can be used to determine the parking supply needed in a particular development.

Austin Parking Benefit District (www.ci.austin.tx.us/parkingdistrict/default.htm)

Many neighborhood experience parking spillover problems, including difficulty finding parking for residents and visitors, concerns that public service vehicles cannot pass two lanes of parked vehicles on the street, or that on-street parking reduces neighborhood attractiveness. The city of Austin, Texas is addressing these problems by allowing neighborhoods to establish *Parking Benefit Districts* (PBDs). This involves metering on-street parking and dedicating the net revenue (less maintenance and enforcement costs) to neighborhood improvements such as sidewalks and bicycle lanes. In conjunction with a residential permit system this can ensure that parking is available for residents and their visitors.

Downtown Pasadena Redevelopment (Kolozsvari and Shoup 2003)

During the 1970s Old Pasadena's downtown had become run down, with many derelict and abandoned buildings and few customers, in part due to the limited parking available to customers. Curb parking was restricted to two-hour duration but many employees simply parked in the most convenient, on-street spaces and moved their vehicles several times each day. The city proposed pricing on-street parking as a way to increase turnover and make parking available to customers. Many local merchants originally opposed the idea. As a compromise, city officials agreed to dedicate all revenues to public improvements that make the downtown more attractive. A Parking Meter Zone (PMZ) was established within which parking was priced and revenues were invested.

Connecting parking revenues to added public services and keeping it under local control helped guarantee the program's success. Merchants began to see parking meters in a new way: as a way to fund the projects and services that directly benefit their customers and businesses. The PMZ Advisory Board, consisting of business and property owners, recommended policies and set priorities for revenue spending. Investments included new street furniture and trees, police patrols, better street lighting, more street and sidewalk cleaning, pedestrian improvements, and marketing (including production of maps showing local attractions and parking facilities). To highlight these benefits to motorists, each parking meter has a small sticker which reads, "Your Meter Money Will Make a Difference: Signage, Lighting, Benches, Paving."

This created a *virtuous cycle* in which parking revenue funded community improvements that attracted more visitors, new businesses and residential development, which increased parking revenue, allowing more improvements. Parking is no longer a problem for customers, who can almost always find a convenient space. Local sales tax revenues increased far faster than in other shopping districts and malls with cheaper or free parking. This indicates that charging market rate parking (i.e., prices that result in 85-90% peak-period utilization rates) with revenues dedicated to local improvements can be an effective ways to support urban redevelopment. Pasadena's parking management program consists of many interrelated initiatives.

Regional Parking Management (Tyler, et al. 2012)

British researchers investigated the link between parking and urban centre success. They found:

- More parking does not necessarily mean greater commercial success. Improved parking management can support businesses as much as an increase in parking supply.

- There is no such thing as 'free' parking, parking costs are either borne directly or indirectly.

- Shopkeepers consistently overestimate the share of their customers coming by car.

- Car drivers spend more money per trip; walkers and bus users spend more per week or month.

- A good mix of shops and services and a quality environment are the most important factors in attracting visitors to town centres. If these are poor, then changes to parking or accessibility are unlikely to make a town centre more attractive.

- There is little evidence that parking supply affects the night time economy (entertainment).

GreenTRIP (www.transformca.org/GreenTRIP)

GreenTRIP is a Traffic Reduction + Innovative Parking certification program for new residential and mixed use developments. It rewards projects that reduce traffic and greenhouse gas emissions. GreenTRIP expands the definition of green building to include robust transportation standards for how people get to and from green buildings. Each certified project receives a *Project Evaluation Report* which describes the project location, details and inventories how the project meets GreenTRIP standards.

Seattle Reduces Parking Requirements (Rosenberg 2016)

Real estate market trends and public policy changes are reducing the number of parking spaces included in new apartments in Seattle. Between 2004 and 2016, the average number of parking spaces built per apartment declined from 1.91 to 1.29 in suburban areas and from 1.57 to 0.63 in City of Seattle. This reflects the high costs of building underground parking, estimated to average $30,000 per space, improvements in travel options, including major rail and bus system expansions, and changing consumer preferences toward more car-free lifestyles. In addition, parking is allowed but not required for apartment buildings in many districts including Downtown, Capital Hill, the University District and Northgate and parts of Ballard, Fremont and Greenwood.

Downtown Residential Parking Demand Analysis

Gribb (2015) mapped downtown residential and commercial parking demands, and measured their distance to on- and off-street parking spaces available to those users in downtown Laramie, Wyoming. Street interviews provided information on length of parking, purposes for coming downtown, and the location of destinations once downtown. A three-dimensional land use inventory supplied detailed locations of all activities in each building and floor for the 28 blocks of downtown Laramie. The results indicate that the downtown has 2,130 total parking spaces, but most of these spaces are restricted in terms of who may use them and how long they may park, so only about a quarter of off-street spaces (about 420) are available for overnight use by the 51 downtown housing units that currently lack designated parking space. The authors recommend applying various parking management strategies to ensure that parking spaces meet future demands.

San Francisco Regional Value Pricing Parking Program (http://regionalparking.mtc.ca.gov)
SFpark is a demand-responsive parking pricing program which periodically adjusts meter and garage pricing up and down to match demand, and gives motorists' real-time information on parking availability and prices so they can easily find the best options for their needs, and rely more on underused areas and garages. *SFpark* bases prices on observed occupancy. Planners cannot reliably predict the right price for parking on every block at every time of day, but they can use a simple trial-and-error process to adjust prices in response to occupancy rates. This process of adjusting prices based on occupancy is often called performance pricing. In addition to efficiently managing parking, SFpark helps depoliticize the process by setting a clear pricing policy. San Francisco charges the lowest prices possible without creating a parking shortage. Transparent, data-based pricing rules can bypass the usual politics of parking. Because demand dictates the prices, politicians cannot simply raise them to gain more revenue.

This project found the following (Pierce and Shoup 2013):

1. Most study locations have excess parking supply. While some streets have high occupancy rates during peak periods, there are significant amounts of unused parking spaces in lots and structures within a few blocks in almost all the locations at almost all times.

2. Many pricing policies are contradictory. There is a lack of coordination between on- and off-street parking prices. On-street parking prices are often free or lower than off-street parking prices, which often results in drivers clogging up local business districts while they search for a space.

3. Many parking requirements are not closely aligned with demand of the relevant population in the local context. Households that are younger or lower income and who have good walk/bike and transit access have lower automobile ownership rates. High parking requirements make housing less affordable.

4. When parking structures are included in transit projects, there is often a lack of analysis of relative cost and effectiveness of alternative modes of access and pricing on the need for or appropriate size of a structure. Housing would often provide higher transit ridership and more fare transit agency revenue.

5. Employee programs that charge for parking are the most effective in reducing driving to work. However, many employers are reluctant to charge for parking. Parking cash-out is an attempt to put charging for parking into a more favorable perspective, but is seldom implemented.

6. Responsive pricing increases prices in areas with particularly high demand, but reduces prices in a larger number of areas, when and where parking spaces have less than 85% occupancy.

Before SFpark began in August 2011, the on-street parking price $3 an hour at all times. The program applied different prices during three periods of the day—before noon, from noon to 3 pm, and after 3 pm. By May 2012, prices on almost every block had decreased for the period before noon and increased between noon and 3 pm. Most prices after 3 pm were lower than during mid-day, but higher than in the morning. During its first two years, SFpark adjusted prices 11 times on each block for three different periods during the day. Prices increased in 31% of the cases, declined in 30%, and remained the same in 39%. On average, prices declined in the morning and increased in the midday and afternoon. The average price fell 4%, which means SFpark adjusted prices up and down according to demand without increasing prices overall. Because occupancy rates have moved toward the target goals, the share of blocks needing no price adjustment has slowly increased since the program began. By August 2013, after the program had been operating for two years, 62% of blocks were in the target range. Altogether, a third of all the blocks that had been over- or under-occupied at the beginning of SFpark had shifted into the target occupancy range.