

**Investing in Highway Commercial Development: An Introduction to
Alberta's Commercial Safety Rest Area Project**

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ABSTRACT

Alberta Transportation and the Owner's Engineering Consultant Team recently began the Alternate Delivery of Highway (Commercial) Safety Rest Areas (SRA) project. The intent of this project is to develop commercial SRA (CSRA) at no (or minimal) cost to government by having sites operated through an agreement with private developer(s) for a specified time period. Fourteen initial sites on government owned land have been shortlisted with the study team working to determine the feasibility of developing these sites, which are located on National Highway System corridors including Highway 1 (Trans-Canada), Highway 2 (Queen Elizabeth II), Highway 16 (Yellowhead) and Highway 63 (Fort McMurray/Athabasca Oil Sands access). The project requires the team to establish standards for provision of commercial services, conduct a jurisdictional scan of other agencies, develop functional plans and a business case for those sites pursued under this project, and administer the project through to construction.

The project is currently in the functional planning phase of the work, which focuses on understanding the physical and economic strength of each site to support commercial development interests. The viability of the project is largely contingent on having sufficient traffic volumes that will bring in adequate revenue streams for potential development partners throughout the concession period. As such, it is important to establish policies and standards that will provide safe, convenient, comfortable and efficient rest areas to entice road users to utilize these facilities. Site enhancement opportunities (i.e., use of branding techniques to highlight surrounding regional and/or topographic features; provision of additional recreational features; amalgamation with tourism) will be sought for each site to customize these to local, regional and national travel demand needs. Sustainability measures are also being considered that meet green initiatives and support future travel requirements such as electric car charging and truck electrification.

This presentation will address many of the initial considerations made during this first work phase regarding the economic/market factors that influence the viability of introducing commercial development to highway rest areas, site design and layout factors (building and site size, commercial amenities, user amenities, parking allowances, and fueling opportunities), and transportation design factors (roadside or median placement, traffic circulation, parking layout and access management). It will also address other items of interest to practitioners including sustainability, branding, legislation, emerging design and policy issues, and investment demands.

INTRODUCTION

In G. F. King's National Cooperative Highway Research Program (NCHRP) 1989 report on an evaluation of roadside rest areas, he estimated that on rural interstate highways in the United States, the absence of rest areas resulted in a 52 percent increase in shoulder-related accidents. He also projected, based on motorist interviews at 13 rest areas in 5 states that "drivers who are fatigued and who enter a rest area represent an estimated 4.5 percent of the total traffic stream, and that the reduction in driver fatigue accident rates due to the rest area is 3.7 percent." As such, Transportation officials must recognize that the importance of SRA as a whole, be it commercial or non-commercial, have a significant role in enhancing the safety of the highway system. Alberta Transportation has an extensive network of roadside SRA that provide basic amenities to the travelling public including large parking areas, outhouse style washrooms, garbage and recycling receptacles, and picnic tables. Many of these areas are inadequate, do not meet the public's expectations and can be expensive to maintain. As such, the addition of commercial services will seek to address concerns with the existing SRA to increase utilization and enhance the safety of existing facilities.

WHAT ARE SAFETY REST AREAS AND COMMERCIAL SAFETY REST AREAS

The primary responsibility of the province to those using the highway system is safety, with rest areas being an important instrument for its continual improvement. Accident reduction is the primary function of SRA, with the addition of commercial development a subset to this. CSRA introduce a commercial aspect to traditional SRA, providing added convenience, services and amenities to the highway motoring public. Greater highway safety is the major benefit in establishing rest areas, through safe off-road locations for motorists to rest, sleep, change drivers, and check vehicle loads and/or minor mechanical problems. Additional benefits for motorists are relief from extended periods of travel, increased comfort and convenience, and locations for public agencies to communicate with travelers. Well-designed, well-maintained CSRA also create positive images for out-of-province motorists and enhance the quality of life for the province's own residents. They provide opportunities for the province and tourism groups to communicate with motorists in promoting provincial and local programs, to provide road and weather information and directional services such as maps, routing suggestions, traffic incident warnings, and road construction schedules. They can also promote surrounding regional and/or topographic features, while providing recreational sites that promote health and maintain lifestyle choices.

CURRENT STATE OF SAFETY REST AREAS AND COMMERCIAL SAFETY REST AREAS IN ALBERTA

Alberta currently has a series of government owned and operated SRA throughout the province. These SRA ranges from basic pull-outs along the highways to off-site locations with basic services including washrooms, garbage bins and picnic tables. At present, the province does not operate any facilities with commercial components. Despite the prevalence of SRA through the provincial highway network, they are not without challenges. Common challenges are:

1. Lack of amenities – current practices only provide large parking areas, garbage and recycling receptacles, picnic tables, outhouse style washrooms, which do not always meet the needs of road users.
2. Inadequate washroom facilities – concrete unisex washrooms are largely uninviting, have limited or no septic systems, do not meet public expectations, and can be difficult and expensive to maintain.
3. Low utilization by the travelling public – many road users seek to stop elsewhere along the highway system where other amenities are available (i.e., smaller urban areas).
4. Safety – low utilization leads to personal safety concerns at recently constructed sites, and older pull-out style sites are prone to collisions at the access/egress points due to inadequate deceleration/acceleration ramps.
5. Freeway conversion – existing SRA are largely substandard for adoption as part of an access controlled high-speed highway due to limited capacity and inadequate ramps.
6. Operational funding – upwards of \$800/day/washroom at some locations.
7. Maintaining existing facilities through maintenance contracts is challenging and often leads to a level unacceptable to the public.
8. Current SRA network is below the standards employed by many other jurisdictions in Canada and the United States.

Commercial sites in Alberta are primarily privately owned with many located adjacent to provincial highways. At this time, the Province of Alberta does not have any CSRA specific development guidelines. These private commercial sites are constructed based on a developers' singular vision for their site and show limited or no consistency in site design, types of services and amenities provided, and most of all, the level of service. Often, these sites are poorly developed and operated to the point of poor business returns with the resulting effect of the site shutting down. Conversely, there are also well managed and well maintained private sites that operate with a good investment returns and are able to attract other competitors to the market area, but which might cause operational issues on the highway due to site constraints and inadequate site design to accommodate additional services, i.e. inadequacy of heavy vehicle parking leading to parking on the shoulder of the service road and off-ramps.

The province's only involvement is during the approval of the development ensuring that a proposed site will not degrade the operations of the adjacent highway. The CSRA are mostly governed by the local municipality's land development process and that varies greatly from one jurisdiction to another. At present, it is challenging for some commercial operators to meet legislated requirements.

COMMERCIALIZING SAFETY REST AREAS IN ALBERTA

The need for more opportunities to pull off the highway and provide rest/relaxation options is being heightened by various groups internal and external to the provincial government. As well as continued interest from the Alberta Motor Transport Association and the commercial trucking industry, there is pressure from the general public for the province to enhance the quality and experience beyond that currently offered at existing sites. Recognizing the limited effectiveness of provincial SRA to date, or for that matter, some of the privately owned and operated highway commercial services, the province is investigating alternatives to address the various issues brought forward through standardizing and/or commercializing SRA, especially along priority highway corridors such as the Trans-Canada Highway (Highway 1), the Yellowhead Highway (Highway 16), as well as the QEII Highway (Highway 2 between Alberta's two largest urban areas – Calgary and Edmonton). The option of commercializing SRA is not new as other jurisdictions in Canada and the United States have already successfully used this concept to provide higher standard facilities. The province is looking to understand the successes realized by these other jurisdictions to enhance the current experience for all highway users.

SAFETY REST AREAS VERSUS COMMERCIAL SAFETY REST AREAS

In simple terms, a CSRA is an SRA with a commercial aspect, making CSRA a subset of SRA. The table below is a simplified comparison between these two that highlights the benefits of introducing a standardized approach to delivering commercial options along highway corridors.

	SRA	CSRA
Advantages	<ul style="list-style-type: none"> • Improve safety by providing places to rest periodically. • Satisfying the basic needs and operating legislation of the trucking industry. • Provide basic facilities including pit/vault toilet facilities, picnic tables and garbage receptacles. 	<ul style="list-style-type: none"> • Provide suitable 24 hr facilities including flush toilets, telephones, convenience/food outlets, safe parking and fuel. • Integrate with public facilities that address tourism, recreational or other public functions. • Minimal cost to the province/taxpayer throughout the facility's life. • Developer responsible to design, build, finance, operate and maintain for a defined period of time.

	SRA	CSRA
Disadvantages	<ul style="list-style-type: none"> Limited amenities; do not attract motorists to stop and rest. Standard rest areas that include basic washroom facilities cost approx. \$3M – \$4M to construct. Yearly maintenance costs for upkeep of facilities covered within regional operational maintenance contracts – can vary by region. 	<ul style="list-style-type: none"> May compete with surrounding communities. May not all be commercially viable for locations required to support network.

Although there are disadvantages associated with introducing commercial components to existing or proposed SRA sites, there are opportunities to limit possible negative effects of CSRA development. In situations where a CSRA may be viewed as competing with other similar developments either privately owned or as part of a municipality’s economic development strategy, competition clauses within the CSRA contract documents can address the need to achieve harmony with other commercial areas.

Alberta Transportation and the Owner’s Engineering Consultant Team are currently reviewing the feasibility of fourteen sites on government owned land. It is recognized that some of these locations may not be commercially viable as standalone sites; however, they offer benefits to the province from an investment perspective as well as providing opportunities to close the gap in rural locations where there are no services for extended periods of travel. In order to entice the development of such sites, it may be necessary to bundle the commercially attractive sites with those viewed to be less attractive sites in order to balance revenues. This will need to be addressed as part of the contractual arrangements entered into with successful proponents.

THE ORIGINS OF COMMERCIAL SAFETY REST AREAS IN NORTH AMERICA

Both the United States and Canada have varying types of CSRA. While each jurisdiction follows its own guidelines, policies and delivery models for the development of CSRA do however follow similar themes and trends.

UNITED STATES

The origin of dedicated rest areas along portions of the United States Interstate Highway network dates back to a provision in the Federal Aid Highway Act of 1938. Through the Act, Federal funds were first made available with the intent of increasing traveler safety and comfort through providing roadside facilities within the highway right-of-way for motorists to have a place to stop and rest. However, subsequent legislation passed over the years has prohibited the development of commercialized uses such as automotive service stations and other commercial establishments within the right-of-way of the Interstate system, with some exceptions. The primary exception to this restriction has largely been State operated toll road systems that comprise portions of the Federal Interstate Highway network, but receive no federal aid.

In the United States, 15 jurisdictions operating CSRA have been reviewed as part of Alberta’s CSRA project (refer to Figure 1; also shows the number of sites reviewed within each jurisdiction). Almost all of these facilities are located along a tolled highway system, the majority of which comprise portions of the Federal Interstate Highway system. Most tolled systems are intended to be largely self-sufficient as a user pay system. Having to exit the tollway to access fuel, food and other services has been determined to be

punitive to motorists and therefore unreasonable. These conditions, in combination with the legislative controls in place, are a major factor influencing the locations of CSRA in the United States, at this time.

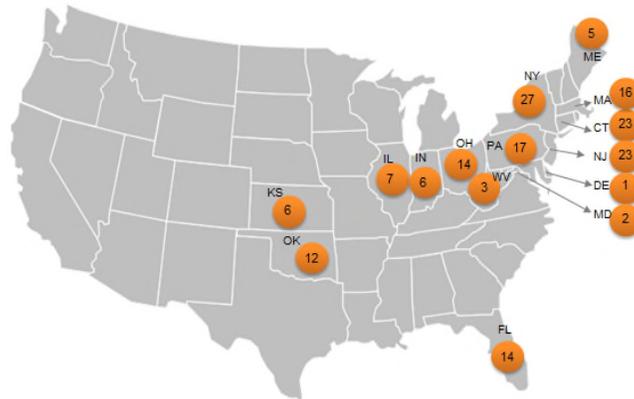


Figure 1: United States Jurisdictions Reviewed with Commercial Highway Facilities

CANADA

CSRA in Canada were first introduced to Ontario during the 1960s in concert with the development of the Province’s Highway 401 corridor spanning between the Windsor, Ontario/United States border to the Ontario/Quebec border. In a similar fashion to the United States, a need was identified to offer roadside facilities along the highway right-of-way for the purposes of providing safety and comfort to the travelling public. Guided by this principle, the Province of Ontario developed a network of CSRA locations, spaced at predefined intervals, spanning the entire Highway 401 corridor. Unlike in the United States, Ontario CSRA were the first to be introduced to a non-tolled highway system and therefore, have a lower degree of exclusivity from direct off-highway competition. The Ontario CSRA network is branded as ‘ONroute’.

More recently Quebec has added nine rest areas (known as “Aires de Service”) to the province’s highway network, of which six are CSRA. Unlike the Ontario example, which services the entire Highway 401 corridor, Quebec CSRA are located along various highway routes surrounding the Greater Montreal Area. Along the more remote stretches of the Quebec highway network, the province is operating other non-commercialized rest areas, similar to Alberta’s current facilities.



Figure 2: Canadian Jurisdictions with Commercial Highway Facilities

HOW THE DEVELOPMENT OF COMMERCIAL SAFETY REST AREAS SHOULD RECOGNIZE THE PUBLIC INTEREST

In addition to accounting for the site, location and economic factors influencing the feasibility of developing and operating CSRA, several jurisdictions fully recognize that the fundamental public interests must be respected, including:

- Safety, comfort and ease of access for the travelling public;
- Ensuring that as a minimum, essential services for the travelling public will be available at a competitive cost;
- Demonstrating the value proposition for money invested in the CSRA development process;
- Guaranteeing appropriate public control/ownership is preserved;
- Making certain that the planning process for a CSRA is fair, transparent and efficient;
- Ensuring compliance with all applicable legislation; and
- Ensuring accountability is maintained throughout the CSRA planning process.

ALBERTA'S VISION FOR COMMERCIAL SAFETY REST AREAS IMPLEMENTATION

Recognizing the value that CSRA will bring to Alberta's highway network, the province has embarked on a journey to broaden the presence of CSRA in Alberta, beyond strictly private developer owned and operated. The province has laid out a specific vision of how CSRA are to be developed. The provincial vision is a network of SRA across a variety of highways in Alberta, situated at locations where the rest areas are appropriate and will contribute towards a safer highway system. The type, size and range of services provided at these rest areas would be determined by the highway classification, traffic volumes, and local factors and through completion of an economic analysis.

This vision will lead to achieving the following key objectives:

1. Improve the safety of the provincial highway network – achieved by closing current gaps in the network and encourage increased use of rest areas by providing higher standard facilities with more amenities.
2. Improving the number and quality of these facilities will increase use and further support the transportation of goods to market.
3. Promote/showcase Alberta's commitment to improving highway safety.
4. Provide a higher quality facility enhancing the travelling experience for all Albertans and for visitors to the province.
5. Highway network approach – provincial network and national highway system:
 - In the planning of future corridor improvements, analysis of the overall highway corridor system should be completed to determine current needs for CSRA. Given that development growth is largely based on the economic conditions of the day, it may be challenging to plan too far into the future for those corridors that demonstrate weak to marginal market and economic characteristics. For those corridors with a higher potential for CSRA sites to succeed, a systems analysis approach may be appropriate. Systems analysis is the process used to determine existing

and future needs of the overall highway network. It is based on the proportion of highway traffic likely to stop at roadside facilities with commercial development. Parameters considered in systems analysis include existing and projected traffic volumes, annual-usage-survey data, establishing a recommended spacing interval and development size controls.

- At this time, the focus of establishing CSRA on the provincial network is limited to Level 1 corridors (part of the National Highway System); however, as needs dictate, it is expected that this may extend to Level 2 corridors (arterials) as well. Level 3 (collectors) and Level 4 (locals) corridors are largely focused on serving shorter duration trips between smaller communities and resource/ industrial developments that may not have significant traffic volumes or economic drivers to support CSRA sites. The spacing of this network is largely limited to 30 km apart so that local and inter-county needs can be met in higher population areas, which may increase in those areas more sparsely populated.
6. The Province will make available currently crown-owned lands along the major highway corridors that meet the Highway Network Approach philosophy, and procure additional lands where necessary, for private entities to develop and operate these CSRA. At the same time, privately owned lands along these major highway corridors can also be developed privately into CSRA if the developers demonstrate they will meet the requirements of the Highway Network Approach philosophy and provide the basic services as defined in the province's CSRA guidelines.
 7. Privately developed and operated with a self-sustaining business model – it is the province's intent not to provide any form of financial incentive for the development or operation of any CSRA. All CSRA development proposals on provincial lands must demonstrate economic viability. In addition, CSRA are not a provincial government sponsored business development that compete with local businesses and establishments. Hence, the development guidelines for CSRA are being developed to achieve a balance between the needs of the highway motoring public, highway transportation requirements, economic feasibility as well as impacts on the adjacent local business communities. The CSRA developer must demonstrate a self-sustaining business model and recognize that even though it will draw its labour force from the surrounding communities, its business will be based solely on serving the travelling public and road users on the adjacent highway.
 8. Branding – consistency in types, quality and level of services are a key component to a successful implementation. For a network of CSRA being developed and then expanded in the future, the importance of branding cannot be overstated. Similar to highway design and operations, consistency helps. The goal is for the province to provide guidance to ensure that any future CSRA in Alberta will be developed using the same guidelines with consistency in the look, design, services, amenities, operations, and maintenance depending on the level of activities. By establishing such, any highway road user can and will know what to expect at the CSRA.
 9. Environmentally responsible and sustainable.
 10. Innovative.
 11. State-of-the-art facilities.

ALBERTA TRANSPORTATION'S COMMERCIAL SAFETY REST AREAS PROJECT....OBJECTIVES

In the spring of 2016, Alberta Transportation commissioned a follow-up project to previous planning initiatives that had identified certain crown-owned properties along four major highways in the province,

namely Highway 1, Highway 2, Highway 16 and Highway 63 that are suitable for development of CSRA. The 2016 project building upon this previous work has these specific objectives in mind:

- Establish standards for developing the current crown-owned lands into CSRA and that guide future privately developed commercial sites.
 - These standards and design guidelines will:
 - Guide the functional design of government owned and future private sites; and
 - Support Alberta Transportation staff in reviewing applications from private developers.
- Functionally design each site according to the new standards.
- Investigate the business case and best procurement approach for developing the crown-owned sites.
- Design, construct, operate and preserve the whole project to department requirements and performance specifications.

THE PROJECT....PROGRESS

The project kicked-off in June 2016. At the time of writing, the project team has completed the following:

- Review of global best practices to establish common practices adopted by transportation authorities operating CSRA.
- Technical review of all 14 Government of Alberta owned sites:
 - Engineering review (physical site conditions and constraints).
 - Market and economic review.
 - Ranking and prioritization of sites amongst each other.
- Developing technical standards.
- Developing functional plans.

The focus for the remainder of this paper is to document some of the technical points of discussion that have arisen to date and present the project team's approach to address such.

THE PROJECT....ADDRESSING SOME TECHNICAL CHALLENGES OR CONSIDERATIONS

Learning from others' experience is a very effective and efficient way when developing new practices, procedures and policies. The global best practices review was very informative in terms of lessons learned for other jurisdictions that have experienced the process of developing CSRA, particularly from a North American perspective. The practices in the United States provided good insights in terms of how the various State Department of Transportations utilized the American Association of State Highway and Transportation Officials (AASHTO) guide. Lessons from Ontario and Quebec are invaluable Canadian experiences. The application from Ontario and Quebec is made even more possible by project team members' direct experience in the Ontario 'ONroute' project or team members' Quebec colleagues' direct experience with Aires de Services project.

However, every project has local factors and local context that must be addressed. Differences in population size, distances between populated centers, highway traffic volumes and composition, geometric and site design constraints, ability to support trucking legislation needs, local climate/topography, and applicable funding models are some of the major considerations that must be factored into the equation when adopting guidelines and standards from other jurisdictions. Nonetheless, the knowledge learned from others played a major role in helping the project team address some of the key technical challenges this project brings. Some of the challenges and/or considerations worth mentioning at this stage in the project are:

ESTABLISHING THE 'RIGHT' AMOUNT OF COMMERCIALISM

As for any commercial venture, economic viability is of paramount importance. The province has set the mandate that all CSRA, be it on crown or private land, will not receive any form of financial assistance from the government. The developer must also demonstrate a self-sustaining business model in the development and operation of a CSRA (be this balanced among one or more sites bundled together), while meeting the guidelines stipulated by the provincial government. Hence, having the "right" types of services at the "right" amount is critical. At the same time, as a CSRA primary purpose is to serve as a highway rest area to provide stopping options without having to make a purchase, it is essential that guidelines be in place to ensure that a CSRA does not turn into an outlet mall with expansive parking lots, becoming a defined destination point. This raises the question of "what is the right amount of commercialism?" Lessons learned from other jurisdictions are to "let engineers and planners be engineers and planners, and let developers be developers". Rather than being too overly prescriptive and rigid in the CSRA development guidelines, the province has taken the approach to mandates certain essential basic services and restrictions expected at CSRA, while leaving it to the developers to determine the amount of commercialism best for development at each site in order to achieve a self-sustaining business model.

DETERMINING APPROPRIATE SPACING INTERVALS

Traditional spacing intervals for SRA sites has largely been based on an approximate 1-hour drive (60 km to 100 km depending on the speed limit of the adjacent highway) between successive locations, which still applies for the most part. This has been reduced to 30 minutes (30 km to 50 km) from urban areas (and private commercial/traveler services) to allow vehicles to stop before or after these areas to meet a variety of driver needs. However, when adding commercial development to an existing SRA or developing a new CSRA site, this distance can be increased or reduced based on market demand, traffic volumes, traffic composition, hours of service, etc. Urban development should be considered as part of identifying potential sites to increase the ability of a site to be self-sustaining as well as accessing labour supply. Where possible, siting of CSRA should consider regional factors including short and long-distance travel needs, proximity to other roadside facilities, tourist information, scenic and points of interest, or other service needs. Existence of other nearby roadside services may present alternate options.

When reviewing the spacing between CSRA, several market and economic variables should be considered beyond any physical and traffic related factors. Such variables include:

1. The local market area
2. Area demographics

3. Accessibility to a labour source
4. Adjacent competition

The local market area is defined as a 25 km to 30 km radius around the subject site for the purpose of examining in detail the competition, demographic and labour characteristics that will impact the commercial viability of a subject site. A 25 km to 30 km radius represents an approximate round trip commute time of one hour from the extremities of the circumference to which supply and labour would be required to make. It also considers targeting those highway corridors that function to serve longer duration trips such as the province's two highest Service Classification corridors.

It is important to place CSRA in locations that can benefit from close access to local labour and retail suppliers. Since the placement of CSRA will be adjacent to the provincial highway network, access to a local labour force (15+ years of age) is more important than retail suppliers, since many of the distribution routes utilize highway corridors. The current and forecasted resident population within a 25 km to 30 km radius of the subject site should be reviewed to determine whether adequate labour can be provided to staff and service the sites.

The type of commercial services to be provided can broadly be defined as quick service retail; fast food service and convenience retail operators that focus on meeting the needs of the travelling public. Quick service retail and fuel service stations situated within the 25 km to 30 km local market area or within close proximity will potentially compete for consumer expenditures being offered at a CSRA. Potential competition can be classified into two specific areas of direct competition: inbound and outbound.

- Direct inbound competition – an inbound competitor encounters the traffic prior to the subject site by virtue of its 'upstream' location along the route and therefore potentially represents the most significant level of competition to the CSRA site.
- Direct outbound competition – an outbound competitor encounters the traffic after the subject site by virtue of its 'downstream' location along the route and therefore potentially represents a somewhat less significant level of competition to the CSRA site. Conversely, the CSRA site represents a more significant level of competition to downstream competitors.

Avoiding sites with direct inbound competition within a local market area is critical to a site's economic feasibility. Sites with outbound competition need to be reviewed carefully to ensure that there is only minimal impact to local area developments. If a potential site is viewed as having significant ramifications to existing local developments, it may be prudent to review alternate sites outside the local market area. Opportunities to enter into partnership with inbound and outbound competition may be a more favourable approach that can enhance commercial opportunities rather than impact them.

Although a 25 km to 30 km radius is suggested, it is important to avoid over-saturating highway corridors with commercial development sites such as CSRA, to allow each site to maximize its revenue potential. Consideration should be given to spacing CSRA at appropriate intervals that maximize potential benefits from local developments, significant junctions and other sources of trip generation. For example, one CSRA might be located to the west of a major highway to highway junction; however, there is significant increases in traffic volumes to the east of the junction given the traffic patterns turning between the two highways, suggesting a location to the east be a candidate site to benefit from traffic not being captured by the site to the west.

ACCESS MANAGEMENT

True to its philosophy, CSRA are not meant to compete with local businesses. The province has mandated access to any CSRA must be directly via the adjacent highway only. Access to/from a CSRA from the adjacent highway must be designed to provincial highway standards. At this time, these standards require sufficient acceleration and deceleration length to accommodate the largest vehicles travelling on the highway and expected to use the CSRA site. The standards also prescribe the flexibility to modify a site to accommodate future freeway conversation of the adjacent highway as well as to allow a developer to expand a site should it be determined that more commercial and/or other serves be warranted to address specific local needs and conditions. Under extenuating circumstances, access to a CSRA via an adjacent highway interchange to capture the cross highway traffic may be considered. Access via a median crossing will not be permitted for safety reasons and to prevent degradation of the highway level of service, unless it can be demonstrated that such degradation will not occur or can be adequately addressed to the satisfaction of the province. In addition, there will be no direct access for the public to the local roadways for more convenient travel to adjacent communities. Connection to local roadways would be for emergency access only, which must then be gated and can only be accessed by emergency first responders or for highway maintenance requirements.

MEDIAN SITING

The restriction of no-median crossings to access any roadside located CSRA essentially limits the business for the CSRA to only one side/direction of the traffic on the highway unless some form of grade-separation is constructed; hence it can significantly reduce the economic viability of a CSRA. However, if a CSRA is situated within the median of the highway, it can capture traffic from both sides/directions, essentially doubling the exposure and business viability. There are also situations where developing individual CSRA on both sides of the highway to serve the travelling public is not feasible from an economic perspective, but also from physical factors (i.e., land requirements), hence making median sites an ideal solution. Unfortunately, the median situated CSRA would require left hand entrances and exits to/from the highway. This is a departure from “conventional highway geometric design best practices” and contrary to standard practices of many transportation authorities. However, the review of global best practices revealed that approximately half of the jurisdictions reviewed operate median sites that capture higher volumes of traffic and are designed to the local standards adopted for that jurisdiction. As such, Alberta Transportation is currently reviewing the applicability and requirements for those sites where a median CSRA may prove to be a feasible option.

SITE PLANNING AND DESIGN

Effective site planning is a critical success factor for any commercial development. The challenges of effective CSRA site design is further complicated by the remoteness of some of the sites. This remoteness can pose significant challenges to servicing the site, be it water, sewer, sanitary, electricity or others. At the same time, the remoteness of sites can also present challenges for site security as well as emergency response. Sustainable development and/or low impact development philosophies must be considered. Initiatives such as renewable energy sources, recycled water usage, dark-sky concept are opportunities that will need to be explored as the project develops further. Incorporation of Crime Prevention through Environmental Design (CPTED) philosophy, an on-site RCMP kiosk and emergency phones are examples of mitigations towards better site security. At the same time, the architectural design must also take into consideration local factors to avoid “out-of-place” scenarios. Vernacular designs are being encouraged, i.e., those that complement and seek to enhance the surrounding landscape. In short, the transportation

authority must recognize that despite CSRA being largely transportation related projects, overly prescriptive requirements are not advisable, and that there isn't a "one size fits all" formula for site planning and design, but must be flexible to accommodate the local factors that will attract higher patronage.

PARKING DEMAND

Providing the appropriate number of parking stalls for the various vehicle classes at a CSRA is an important part of the planning and designing for any CSRA. An adequate number of parking spaces of the right size to accommodate the various types of vehicles, and a functional parking lot layout are all important factors.

The exact number of parking stalls for passenger vehicles will be best determined by the developer based on the highway class, traffic volumes, vehicle classifications as well as the types of services provided at the CSRA. However, the number of stalls must, at a minimum, be equal to that stipulated for passenger parking demand for SRA in Alberta. The developer must provide supporting documentation to demonstrate the justification for the number of parking stalls proposed, as well as meeting any local municipality's land use bylaws, policies and regulations if applicable, as part of the procurement and/or approval process.

A CSRA that provides truck services will generate more truck visits. Developers are required to establish the appropriate number of stalls for truck parking, and the corresponding parking lot layout and operations to serve its clientele based on business needs. Moreover, if a CSRA is situated along a highway that sees frequent over-dimensional vehicles, due consideration must also be made to plan the CSRA to service over-dimensional vehicles.

TRAFFIC CIRCULATION AND PARKING LAYOUT

It is desirable for parking lots to only be as large as required to meet site requirements while providing a logical circulation pattern. Oversized lots can confuse motorists and appear harsh and uninviting as drivers approach the site amenities. Where parking areas are very large or linear, options are available to soften the expanse of pavement and reduce its visual impact.

Ideally, the parking layout should be designed to enhance the safety of all users and avoid conflict between vehicles and pedestrians. It is usually easier for passenger vehicles to park adjacent to facilities than it is for heavy vehicles with limited vision and wider turning circles. In addition, as it is expected that a higher number of passenger vehicles will utilize the CSRA sites, provision of parking for this vehicle type adjacent to the amenities better serves the demand and function.

Heavy vehicles and recreational vehicles (RVs) should have designated parking areas away from public facilities and higher-use pedestrian crossings to enable them to enter and exit easily without needing to reverse and to minimize conflict areas. Care must be taken to ensure long vehicles can easily enter any areas set aside for their accommodation.

Specific aspects that will guide the physical parking layout include:

- Vehicular and pedestrian routes should be safe, simple, direct, and obvious.
- One-way circulation.
- Existing landscape features should be preserved to the greatest extent possible.

- Areas for snow storage should be given due consideration.
- Handicapped parking must be provided and situated as close as possible to the main building as well as main outside amenity areas.
- Separate parking areas for trucks/RVs/buses and passenger cars should be well defined.
- For new designs, locate large-vehicle parking on the far side of the site away from the highway for improved highway visibility and site security purposes.
- Provide pull through stalls only for larger vehicles.
- Provide shade for vehicles where practicable.
- Curbs along entrance roadways and around parking lots provide excellent traffic delineation and can be used to define ramp edges within the rest area.
- Barrier curbs should not be used on high-speed portions of the entrance and exit ramps.
- Curbs are recommended around all parking lots and for islands separating car and truck parking areas. Use of curbs and subsurface-drainage systems in wooded locations permits designers to substantially reduce the impact of roadways on the site. Eliminating shoulders and ditches allows designers to locate roadways nearer existing trees, helping to blend roadways and parking lots into the site.

COMPATIBLE SERVICES

The services to be provided at a CSRA must be compatible with the intended function of the site. The primary purpose of CSRA is to serve the needs of the travelling public and commercial operators by providing access to enhanced services beyond tradition SRA amenities. The intension is to limit the number of commercial services available at each site to avoid situations where these sites become primary focal points or destinations. Appropriate land uses and services that can be provided at CSRA, as well as those deemed to be incompatible with the intended function are presented below to guide developers and planners in the development of these sites.

Compatible	Incompatible
<ul style="list-style-type: none"> • Fuel pumps – separate areas for cars and trucks • Convenience store • Restaurant – fast food • Restaurant – sit down (i.e., coffee shop) • RV dump station • Load check and weigh scales • Picnic areas • Light recreational – dog walk areas, walking trails • Kids playground area • Highway patrol/emergency service accommodation • 24 hour washrooms – family room and change stations • Campground • Tourism information kiosk – promote 511 • Park and ride 	<ul style="list-style-type: none"> • Big box retail • Strip malls • Office/administration blocks • Retail parks • Hotels/motels • Boat launches • Off-road trails or facilities • Unlicensed vendors (car peddlers)

This list is not exhaustive but serves to establish the intended function of each site.

Site services beyond specific land uses should be determined during the planning of each site to confirm the need to provide/accommodate the following, as these services may influence the provision of utilities required. The number and placement of each service should also be determined to meet anticipated demands. Possible services include:

- Drinking water/water fountains;
- Map and information displays;
- Highway memorial/educational areas;
- Vending machines;
- Community noticeboard/local advertising posting area;
- Showers;
- Plug-in receptacles;
- Truck electrification stalls;
- Electric vehicle charging stations;
- Computer kiosks;
- Historical and/or environmental interpretation areas;
- Scenic overlooks;
- External artwork, sculptures or landscaping features;
- Outdoor shelters;
- ATMs;
- Wi-Fi; and
- Cell phone charging stations.

ENVIRONMENTAL STEWARDSHIP

An evaluation of a site's environmental features should be conducted to identify any potential biophysical features and infrastructure that may be impacted by site development or that may potentially create additional costs for development. Potential constraints include natural areas (e.g., wetlands, watercourses, woodlots, rare species and high water table) as well as existing infrastructure (e.g., pipelines, well sites and power corridors).

BRANDING

The branding of each CSRA enables the highway motoring public to recognize these facilities within the highway network when they see a highway information sign with the CSRA brand or the CSRA site signage. Not only that, the branding also informs the motoring public what they can expect from these provincially sanctioned CSRA in terms of the types of services and amenities, as well as the level of service expected.

As this project progresses, specific branding items will be defined to provide the desired level of consistency and expectations associated with these sites.

INVESTMENT CONSIDERATIONS

The main objective specific to CSRA implementation is to provide a cost effective operation (for both public and private partners) while enhancing the experience and safety for all road users of the provincial highway system. In order to achieve this goal, strategic investment is required in terms of capital expenditures and/or real estate. For this particular project, the province is providing the lands required to implement CSRA at a maximum of 14 sites. All other investment demands for CSRA implementation will be provided by project partners that have expressed their interest to design, build and operate these sites for a yet to be determined specific timeframe.

Investment for each site will vary based on many factors: specific modifications required of existing facilities, the closing of any gaps with respect to infrastructure needs (e.g., site servicing, grading, paving, addition of ramps), new market opportunities, objective bases for project selection (i.e., ranking of needs), supporting evidence required to justify investment expenditure (i.e., economic feasibility), the ability to increase operational efficiencies beyond current levels, and any other metrics deemed appropriate to support CSRA implementation.

ADDITIONAL EMERGING DESIGN ITEMS

In addition to the various items noted previously, there are many emerging areas where the project team is seeking to understand how these can be incorporated into the site design for the individual CSRA. At the time of preparing this paper, there are few details that can be provided; however, it is hoped that these details can be shared in the future. These areas of emerging design include:

- Green building technology – Leadership in Energy and Environmental Design (LEED);
- Vehicle charging and truck stop electrification;
- Alternative energy – solar/wind;
- Personal wellness/active transportation;
- Tourism/educational information;
- Cutting edge design concepts; and
- Integrating vernacular architecture to enhance site topographic features.

STRIKING A BALANCE BETWEEN ECONOMIC VIABILITY AND HIGHWAY SAFETY

Throughout the project, the team must not lose sight of the ultimate purpose of the project, i.e., to provide a network of CSRA across the province to enhance highway safety. At the same time, the project team must also recognize that some of the locations where CSRA would be beneficial may not have the traffic demand to enable economic viability. As such, creativity in the procurement approach will be needed. Options including bundling of CSRA sites as one package and a scalable approach to site design and provision of services/amenities are examples of means towards achieving the greater goals. The needs further reinforce the notion of not being overly prescriptive in the site development requirements, but allowing the developers the flexibility to be innovative while meeting the basic mandates and

guidelines stipulated by the province for developing CSRA. In other words, the province has taken a position that is beyond collaborative but a partnership approach in delivering the CSRA project. Ultimately, what matters most is striking a balance to enhance the overall well-being of Albertans and that of the motoring public on provincial highways.

NEXT STEPS...WHERE DO WE GO FROM HERE?

In the continued approach of partnership with the potential CSRA developers, the project team will undertake some market sounding to gauge the industry's appetite for such development opportunities, as well as insights towards, amongst other things, the state of the development environment, bundling of potential CSRA sites, and structuring of the procurement process. The feedback received from potential development partners will guide the province towards the finalization of the delivery model, procurement process and financial implications.

The project schedule calls for initiation of the Request for Qualifications and the Request for Proposals process in the spring of 2018, with the staged design and construction period estimated between 2018 and 2021.

The project team looks forward to updating this paper at future conferences to share our experience in terms of how the subsequent phases of the project unfold as well as updating the lessons learned and the various challenges are addressed.

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