APPENDIX C

Review of Experience Elsewhere

Technical Memo #02

Date:	Thursday, January 11, 2018
Project:	Rocky View County - Active Transportation Plan South County
To:	Greg van Soest, Rocky View County
From:	Stephen Power, HDR
Subject:	Review of Experience Elsewhere

Purpose

The purpose of this review is to provide the project team with case studies and lessons learned that will help to inform future recommendations for the Rocky View County Active Transportation Plan (RVC ATP) - South County. The review is focused on plans from municipalities that share similar contexts to RVC in terms of geography, population, climate, and/or land uses.

The plans/projects reviewed include:

- Arapahoe County Bicycle and Pedestrian Master Plan (2017)
- Columbus Area Active Transportation Plan (2016)
- Halton Region Active Transportation Plan (2015)
- County of Peterborough Active Transportation Plan (2016)
- Kern Region Active Transportation Plan (2017)

Arapahoe County Bicycle and Pedestrian Master Plan (2017)

Arapahoe County is situated along the southwestern edge of the City and County of Denver. The County is primarily urban/suburban in the west and rural in the east.

The Arapahoe Bicycle and Pedestrian Master Plan provides an explanation of methodology throughout the plan, which helps the reader understand the recommendations and decisions made during each step of the ATP development. Two areas stand out: the evaluation of existing facilities and the prioritization of projects within the proposed active transportation network.

Existing Facility Evaluation Tools

- **Level of Traffic Stress (LTS) Tool** uses roadway characteristics, including: traffic speeds and volumes, number of thru lanes, and, if applicable, bike lane width, to calculate a grade. Grades are based on a scale of 1 to 4, and correspond to the level of comfort. The LTS was applied to the urbanized area of Arapahoe County, specifically streets classified as a Major Collector and higher in the County, regardless of whether or not a bicycle facility exists
- **Rural Road Biking Assessment Tool** considers a variety of roadway characteristics, including a few only relevant to rural roads, this tool designates the cycling conditions on each assessed road as good, moderate, or poor.

- **Pedestrian Demand Index** identifies locations in the County that are likely to have 'high' and 'very high' pedestrian demand. Inputs include: employment density, population density, zero vehicle households, urban activity centres, parks/open space/recreation centres, school zones, and transit density. The indices are summarized in a heat map.
- **Barriers to Biking and Walking** is a long list of natural or anthropogenic constraints such as: freeways, highways, arterials, railroads, major parks, and other topographic or natural features.

Proposed Active transportation Network Project Prioritization
After recommending an active transportation network, the plan prioritizes projects within the new network by using a scoring system based on the following criteria:

- **Demand for Biking and Walking:** job density, population density, zero vehicle households, urban activity centres, parks and open space, school zones, and transit density.
- **Access and Connectivity:** scoring considered whether a project would: 1) eliminate a major barrier (e.g., crossing of a railroad, waterway, state highway or six-lane arterial), 2) close a gap in the existing network, and/or 3) on a Regional Bike Route
- **Health and Safety:** considers the number of bicycle or pedestrian crashes within the project area.
- **Land Use Context:** Projects located in areas with a relatively high percentage of low-income and/or minority population received a higher score. For the trail projects, an additional factor of land ownership was considered. Trail projects on public property were given a higher score than those on private property because trail projects within publicly owned rights-of-way are generally easier to implement.

Relevance to RVC ATP South County
The clear explanation of methodologies used during various stages of the plan provides the reader with an understanding of the plan process. A similar explanation of methodology could be included in the RVC ATP South County.

Regarding the evaluation of existing facilities, the use of LTS tool for the Arapahoe County Plan demonstrates the appropriateness for the RVC context.

Regarding network prioritization, the recommended RVC active transportation network will also require prioritization, and will be developed during the Active Transportation Network and Project/Action Plan tasks. There are elements of the Arapahoe County ATP prioritization process that may be appropriate in RVC.

Columbus Metropolitan Area Active Transportation Plan (2016)

The Columbus Metropolitan Area includes the urbanized area around the City of Columbus, as well as the outlying suburban centres and rural lands. The Columbus Area ATP was created as part of the 2016-2040 Columbus Area Metropolitan Transportation Plan. As part of the education and implementation of the ATP, the Mid-Ohio Regional Planning Commission (MORPC), responsible for plan, developed two tools: a Story Map and a Cost Estimator Tool.

Story Map

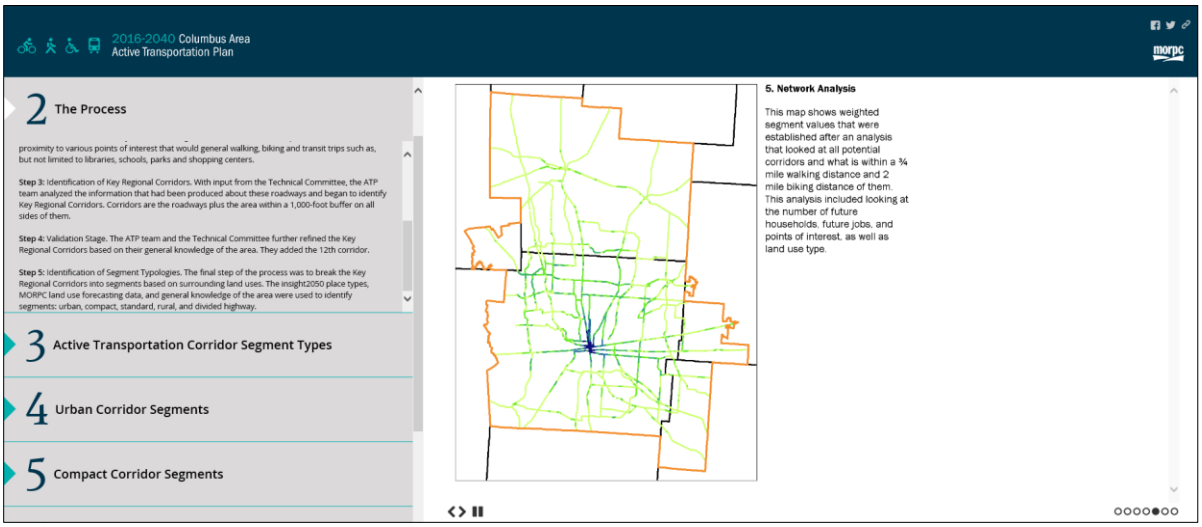
The Story Map was a request from the ATP Advisory Group who wanted a version of the ATP that they could easily access on a computer, smartphone or tablet at meetings. The project used Esri's Story Maps to deliver a web-based version of the ATP. Story Maps is an online platform that combines authoritative maps with narrative text, images, and multimedia content.

The Columbus Area ATP Story Map breaks the ATP down into eight chapters:

1. Introduction and plan purpose
2. ATP process
3. Active transportation corridor segment types.
4. Urban corridor segments and associated facilities.
5. Compact corridor segments and associated facilities.
6. Standard corridor segments and associated facilities.
7. Rural corridor segments and associated facilities.
8. Divided highway corridor segments and associated facilities.
9. An interactive map.
10. Glossary of facility types.

An excerpt of the Columbus Area Story Map is shown in **Figure 1**.

Figure 1 Excerpt from the Columbus Area Story Map showing text and visuals associated with Chapter 2



Cost Estimator

The ATP Cost Estimator is a downloadable Excel file hosted on the MORPC ATP site. The MORPC found that many municipalities within the Columbus Area were quickly dismissing the inclusion of active transportation facilities in projects due to a lack of planning-level active transportation cost estimating tools.

The Cost Estimator spreadsheet includes separate sheets for estimating sidewalks, multi-use paths, and bike lanes. Unit rates are based on Ohio Department of Transportation (ODOT) past projects. An example from the Cost Estimator tool is shown in Figure 2.

Figure 2 Cost Estimator sheet for Multi-Use Paths. Unit rate assumptions included within a separate sheet in the Excel file.

morpc
Mid-Ohio Regional Planning Commission

Multi-Use Paths Cost Estimating Tool

The estimated range of additional construction costs to include this component with the base project is:

Low: $0
High: $0

This range does not include costs for design, right-of-way acquisition, utility relocation or construction inspection.

#	Question	Answer	Units	Notes
	Dimensions			
1	Length of roadway with multi-use path to be constructed on **only one side** of roadway.		miles	If known, exclude lengths of crosswalks, existing multi-use paths that will not be replaced, and other segments not requiring multi-use path construction.
2	Length of roadway with multi-use path to be constructed on **both sides** of roadway.		miles	If known, exclude lengths of crosswalks, existing multi-use paths that will not be replaced, and other segments not requiring multi-use path construction.
3	Total length of multi-use path to be constructed.	0	miles	This is a calculation that is shown for you to check your entries in #1 and #2.
4	Average width of multi-use path to be constructed in each direction. If the widths differ by direction, enter the average.		feet	10 ft is the minimum recommended width of a two-way multi-use path in many design resources.
5	Average width of buffer from curb/edge of road pavement to edge of multi-use path.		feet	5 ft is the minimum recommended distance between a path and the edge of paved roadway/curb. 2 ft is the minimum recommended lateral clearance from obstructions in many design resources.
	Clearing			
6	Will multi-use path construction require additional tree removal?		Yes/No	These are trees that would not be removed for the base project.
7	If so, how many of those are **large** trees?		large trees	Trees that are 75 ft tall or taller.
8	If so, how many of those are **small** trees?		small trees	Trees less than 75 ft tall.
	Structures			
9	Does the roadway have any culverts that will need to be modified or replaced to construct multi-use paths?		Yes/No	A culvert is a structure that allows water to flow under a road and is typically embedded so as to be surrounded by soil. It may take the form of a metal pipe or a concrete tunnel. The referenced dimension is the width or diameter of the culvert.
10	If so, how many of those are **small** (< 3 ft) culverts?		culverts	
11	If so, how many of those are **medium** (3 ft to 10 ft) culverts?		culverts	
12	If so, how many of those are **large** (> 10 ft) culverts?		culverts	
13	Does the roadway have any bridges?		Yes/No	
14	If so, how many bridges?		bridges	
15	If so, what is the total (combined) length, or span, of the bridges?		feet	For example, a 50-ft long bridge and a 100-ft long bridge would be 150 ft.
	Crossings & Bus Stops			
16	Number of 4-way intersections. Also include intersections with 5 or more legs.	0	intersections	This is a calculation that is shown for you to check your entries in #17 and #18.
17	How many 4-way intersections will be **signalized?**		intersections	These intersections will have a traffic signal when the project is complete.
18	How many 4-way intersections will be **unsignalized?**		intersections	These intersections will NOT have a traffic signal when the project is complete.
19	Number of 3-way or "T" intersections.	0	intersections	This is a calculation that is shown for you to check your entries in #17 and #18.
20	How many 3-way or "T" intersections will be **signalized?**		intersections	These intersections will have a traffic signal when the project is complete.
21	How many 3-way or "T" intersections will be **unsignalized?**		intersections	These intersections will NOT have a traffic signal when the project is complete.
22	Number of driveways the multi-use path would cross.		driveways	Include any driveways that will NOT have curb ramps or any drives intersecting the project not considered intersections for #16 and #19.
23	Number of crosswalks NOT located at intersections included above.		crosswalks	Mid-block crossings, for example.
24	Number of additional passenger pads for bus stops.		pads	In absence of a determination, enter the number of bus stops within the project. This assumes that adding multi-use paths will require the addition to the base project of a passenger pads at each bus stop. See references for more information.
	Other Considerations			
25	Will the facility require the project to add curb and gutter that is not included in the base project?		Yes/No	
26	Will the proposed multi-use path require utilities to be moved that would otherwise not be moved?		Yes/No	
27	If so, are these utilities currently located within the public right-of-way?		Yes/No	If not, then report that there would likely be extra utility relocation costs not calculated with this tool.

Relevance to RVC ATP South County
The Story Map tool could be used as an end product or as a public/stakeholder engagement tool. Story Map's functionality includes the ability to draw lines, add pins and make comments.

A cost estimation tool could be considered as an implementation item used in conjunction with facility design guidance and developer's checklist. The tool may be used by RVC staff, local advocacy groups, or developers in determining planning-level cost estimates for the construction of active transportation facilities within the County.

Halton Region Active Transportation Plan (2015)

The Regional Municipality of Halton is situated directly adjacent to the City of Toronto and includes the City of Burlington and Town of Oakville. The lands along the southern part of the Region, along Lake Ontario, are largely urban, while the area to the north is more rural.

The Plan includes an Implementation Strategy that identifies the most cost-effective method for building cycling and walking facilities is to construct them as part of roadway resurfacing and construction projects. This approach is aligned with the Region's Roads Capital Program and Roads Resurfacing Program.

The Plan identifies three strategic implementation areas: Road Capital Program, Road Resurfacing, and Active Transportation Projects. Within these three areas the Plan then identifies the total length and cost of new on-road facilities, new off-road facilities, and upgrades/replacement of off-road facilities. These proposed total length and estimate costs are shown in Figure 3 and Figure 4 respectively.

Figure 3. Active transportation facility by implementation strategy

Type of Active Transportation Facility by Implementation Strategy	Proposed Length (lane-km)	Percent of Total Length of AT Network
Road Capital Program	**705[a]**	**80%**
Build new on-road cycling facility	352	
Build new off-road cycling and / or walking facility	216	
Replace off-road facility (widening) [a]	137	
Road Resurfacing	**137**	**15%**
Build new on-road cycling facility (widening)	124	
Build new off-road cycling and / or walking facility	13	
Active Transportation Projects	**46[a]**	**5%**
Build new on-road cycling facility	18	
Build new off-road cycling and / or walking facility	10	
Replace off-road facility	18	
Total New Active Transportation Facilities	**733[a]**	**100%**

Notes:

a. Total length does not include 155 km of existing off-road facilities being replaced with road widening projects

The Plan then provides a breakdown of construction cost estimates, as shown in Figure 4.

Figure 4. Active transportation facility construction cost estimates (2013 dollars)

Type of Active Transportation Facility by Implementation Strategy	Approximate Construction Cost[a] ($ million)	Percent of Total Cost
Road Capital Program	**$86**	**76%**
Build new on-road cycling facility	$39.6	
Build new off-road cycling and / or walking facility	$27.7	
Replace off-road cycling and / or walking facility (widening)	$18.6	
Road Resurfacing	**$16**	**14%**
Build new on-road cycling facility (widening)	$12.3	
Build new off-road cycling and / or walking facility	$3.9	
Active Transportation Projects	**$11**	**10%**
Build new on-road cycling facility	$5.3	
Build new off-road cycling and / or walking facility	$5.2	
Total Cost to build AT Network	**$113**	**100%**

Notes:

a. Approximate costs are based on benchmark costs of construction for major contract items, plus 15% contingency and 15% engineering. It does not include planning, property (if required), utility relocations (an allowance has been included for relocating some hydro poles as part of sidewalk construction in standalone active transportation capital projects), maintenance and taxes.

Relevancy to RVC ATP
Coordination with capital plans road resurfacing programs was demonstrated as an important principle for efficient implementation in Halton Region. A coordinated implementation strategy may also be appropriate for RVC.

County of Peterborough Active Transportation Master Plan (2017)

Peterborough County is east of the Halton Region in Southern Ontario and is centered on the City of Peterborough. The greater region includes a mix of townships, agricultural and recreational uses. The Peterborough County ATP focuses on cycling. The Plan includes recommendations for policies related to planning/development and infrastructure design:

1.0 Planning

1.10 Bicycle parking facilities/amenities should be considered as a requirement in new buildings, through Site Plan Control, as part of the development application process where appropriate.

2.0 Design

2.3 The County and the Townships should consider a policy for the provision of a stepped warrant for the provision of paved shoulders, where feasible and as part of rural reconstruction and resurfacing projects, to improve safety, reduce maintenance costs and support active transportation.

An example is as follows: Low volume roads (AADT< 1000): shared use of the traffic lane with a desirable 0 - 0.5 m partially paved shoulder. - Medium volume roads (1000 < AADT 5000): a desirable 2.0 m fully paved shoulder on higher speed roadways with a posted speed limit > 60 km/h.

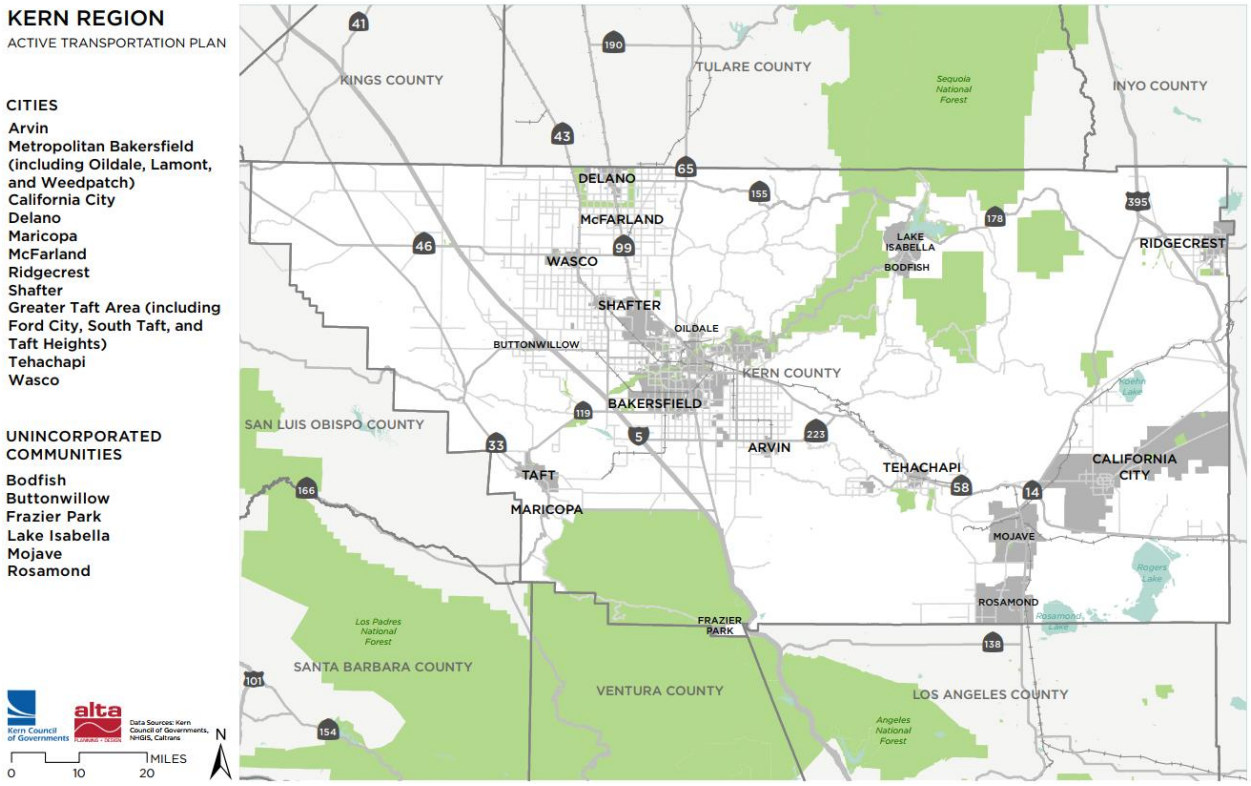
Relevance to RVC ATP South County
Policies related to end-of-trip facilities and standardized paved shoulders are potential policy considerations in RVC.

Kern Region Active Transportation Plan (2017)

Kern County is located in the southern end of California's Central Valley, and is known as one of the fastest growing areas in the United States. The County's economy is closely linked to agriculture, aviation/military, and petroleum extraction. The Kern County ATP focuses on walking, bicycling and transit access.

Due to the vastness of Kern County, the Plan breaks down active transportation network recommendations into focus areas, as shown in Figure 5. Regional bicycle connections were previously completed Kern County Bicycle Master Plan in 2012.

Figure 5 Kern County ATP focus communities



Relevance to RVC ATP South County

While the development of an active transportation network will be considered for the entirety of the South County study area (Elbow River Ranch Lands and Bow River Plains Regions), there an opportunity to apply the concept of focus areas, such as Langdon and Bragg Creek.