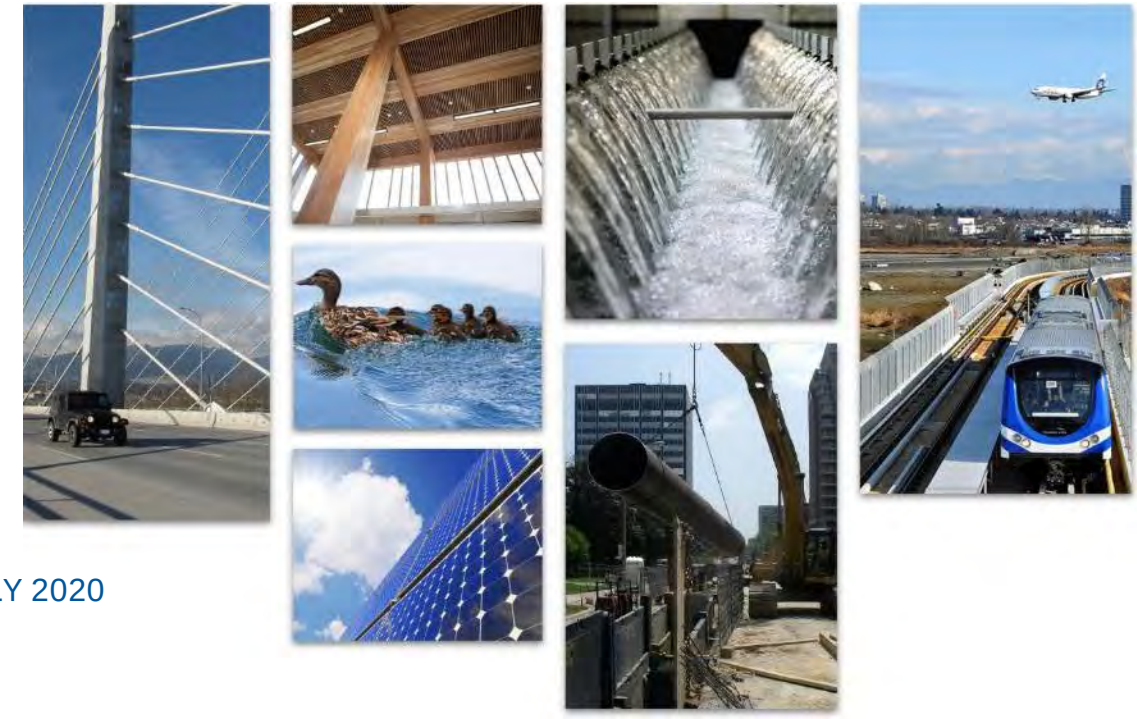
Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

REPORT

City of Saskatoon

Bridge Shared Use Path Audit
Final Report



JULY 2020

EXECUTIVE SUMMARY

The City of Saskatoon commissioned Associated Engineering to complete an audit of cycling and pedestrian facilities on and approaching 40 overpass and underpass structures from the perspective of pedestrians and cyclists. The study focussed on geometric design and operational safety of each location using Road Safety Audit (RSA) methodologies and the applicable principles of Crime Prevention Through Environmental Design (CPTED) as it applies to personal safety. The project includes river crossings, interchange locations, overpasses, and pedestrian underpasses. Downstream intersections and crossing points were also considered as part of each study area.

Context specific shared use path audit methodology was developed based on a body of audit methodology works, guidelines, and handbooks from communities across Canada and internationally. An audit form was created using the software Survey 123, a GIS enabled survey tool that allows field staff to upload data live to centralized cloud storage. The form focused on physical and personal safety, noting existing geometry, degree of separation, conflict points with vehicles, lighting, sightlines, and maintenance. Auditors with RSA and CPTED experience visited each location in the day and night to record their findings as both pedestrians and cyclists. Where applicable, cyclists travelled on both the pathway and the road to assess the facility from the perspective of varying levels of cycling confidence.

A five-year collision analysis was conducted at each study site from 2014 to 2018. 58 collisions involving pedestrians or cyclists were recorded by SGI over the five-year period; no fatalities were noted in the 40 study locations. Three intersections (7% of study areas) represented 31% of all collisions for all 40 study locations:

- Signal timing adjustments are suggested to address collision rates at 33rd Street W and Avenue W N.
- Access consolidation and improved visibility at private accesses are recommended on 8th Street between Arlington Avenue and Circle Drive.
- Ongoing monitoring is recommended at the intersection of Taylor Street and Arlington Avenue; changes to intersection geometry where implemented in 2018 and are not shown in the dataset provided.

The three locations had higher than average collision history project wide (1.5 collisions/site) and for the 14 sites that had a 5-year collision history (4 collisions/site).

A qualitative risk assessment was developed that systematically combined field observations and engineering judgement, resulting in a relative risk ranking of the 40 locations. This ranking will help prioritize the implementation of recommendations. Facility user statistics were not known at the time of the study and as a result, the risk ranking did not account for the volume of active transportation (AT) users exposed to a given risk. Some assumptions can be drawn from surrounding land use and this should be accounted for when prioritizing works. For example, if the surrounding land use types tend to generate higher volumes of pedestrians and cyclists, the priority of the site should be increased as higher volumes of pedestrians and cyclists will be exposed to the risk.

Generally, age of bridge structure and surrounding land use affected the level of safety for many sites, where most new structures provide good connections for pedestrians and cyclists. Many older structures are either constrained laterally and vertically and do not meet current guidelines and standards. Resolution of these deficiencies is complex because some are owned or controlled in part by other jurisdictions or would require significant funds to upgrade to current standards.

Over 500 recommendations were made averaging 12 recommendations per site. There are many opportunities for quick wins and small changes that can be implemented in the short term. Improvements such as the addition of

intersection crossing treatments, shared use path signs and AT guide signs, as well as the rejuvenation of public murals, and removal of graffiti can be implemented quickly for a relatively low cost. These quick wins are accompanied by long-term solutions to address the root cause of identified safety issues that may be scheduled to coincide with nearby work or when sufficient budget has been secured. Some options require significant reconstruction to meet current guidelines and standards. Most paths within the 40 study locations do not meet the 3.0 m desirable width of a shared use path and underpass locations do not meet current clearance guidelines. As discussed in this report, channelized right turns are a documented safety hazard for pedestrians and cyclists but are commonly implemented in cities to improve vehicular traffic flow. The benefits of a shorter crossing distance and a pedestrian refuge island are outweighed by high skew angles and speeds of incoming vehicles. Future channelized right turn lanes should be avoided where possible and existing channelization may be converted to high entry angle slip ramps to reduce the skew angle of the approach road and increase safety for pedestrians and cyclists.

Cost estimates are provided for some recommendations made in this report. They are included in Appendix B.

The study process and report findings will be presented to a technical group at the City of Saskatoon once recommendations have been finalized.

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1 INTRODUCTION

The City of Saskatoon (City) engaged Associated Engineering (AE) to complete an audit of cycling and pedestrian facilities on and approaching 40 overpass and underpass structures. The study focussed on geometric design and operational safety of each location from the perspective of pedestrians and cyclists and the applicable principles of Crime Prevention Through Environmental Design (CPTED) as it applies to personal safety. The project includes seven river crossings, seventeen interchange locations, eight pedestrian overpasses, and eight pedestrian underpasses. Downstream intersections and crossing points were also considered as part of each study area. An overview of the overpass and underpass locations is illustrated in Figure 1-1.

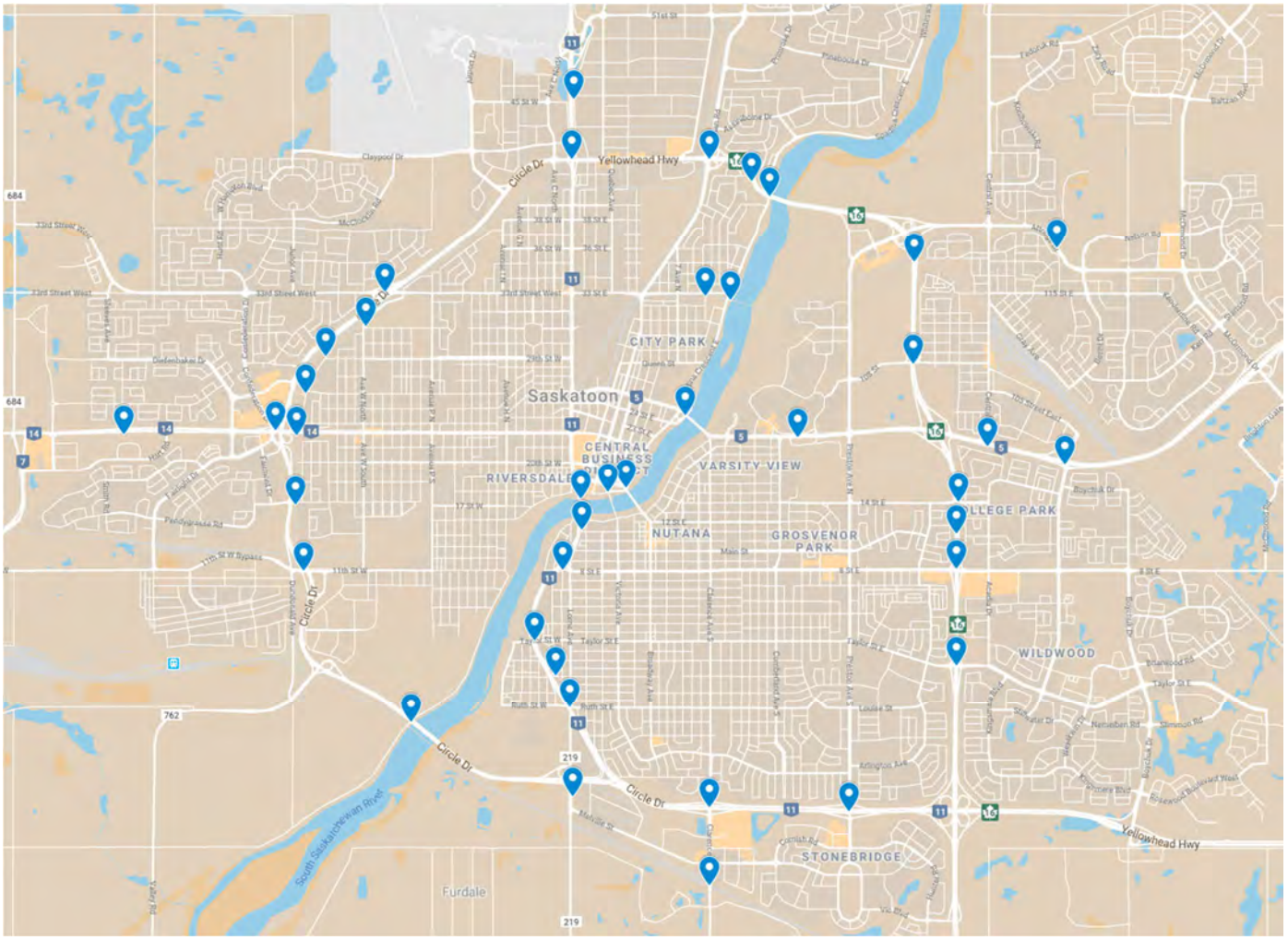

Figure 1-1
Audit Locations

Study locations are referred to throughout this document and audit by location name and an assigned ID. Table 1-1 summarizes audit location name and ID.

Table 1-1
Audit Locations and Site ID

Location	Site ID	Location	Site ID
Circle Drive North / Stew Uzelman Pedway	1	Idylwyld Dr & Taylor St	21
CPR Bridge	2	Idylwyld Dr & 8th St / Lorne Ave	22
University Bridge	3	McKercher Dr & College Dr	23
Broadway Bridge	4	Clarence Ave S - railway	24
Traffic Bridge	5	College Dr & Central	25
Sid Buckwold Bridge	6	22nd St W by Circle Dr	26
Gordie Howe Bridge	7	22nd St by Shaw Centre	27
Circle Drive E & Idylwyld Dr N	8	Idylwyld Dr by St Patrick Ave / Hilliard St	28
Circle Dr & Warman Rd	9	Idylwyld Dr N by 45th St	29
Circle Dr & 108th St	10	University and College Drive	30
Circle Dr & 14th St	11	Circle Drive & Pembina Pl/Rupert Dr	31
Circle Dr & 8th St	12	Circle Dr & Adolph Cr/Preston Crossing	32
Circle Dr & Taylor St	13	Attridge Dr & Rosso Rd / Forestry Farm Drive	33
Circle Dr & Preston Ave	14	Circle Dr & Clancy Dr / 18th St	34
Circle Dr & Clarence Ave	15	Circle Dr & Vancouver Ave	35
Circle Dr & Lorne Ave	16	Circle Dr & 29th St	36
Circle Dr & 11th St	17	Circle Dr & Edmonton Ave	37
Circle Dr & 22nd St	18	Idylwyld Dr & 11th Street	38
Circle Dr & 33rd St	19	Circle Dr & Harrington Cr/Lindsay Dr	39
Idylwyld Dr & Lorne Ave / Ruth St	20	33rd Street & 10th Ave (rail underpass)	40

Pedestrian and cycling infrastructure provide connectivity that is vital to the continued success of increasing active transportation as a preferred travel mode and as a recreational activity. Overpass and underpass structures provide vital links across major roadways, rivers, rail lines, or other physical barriers. Historically, this type of infrastructure was built to the primary requirements of vehicles or was based upon now-out-of-date design guidelines and often presents major hurdles for non-vehicular modes of transportation. Substandard active mode facilities such as these can result in vulnerable users taking on increased risk to continue their journey or, in some cases, may discourage them from using the facilities entirely, opting for lengthy detours or vehicular-based modes of transportation. Improvements at these locations have the potential to improve safety, connectivity, intuitiveness and would support unmet latent demand for additional use of these facilities.

2 BACKGROUND

2.1 Study Process

The goal of this study was to produce a prioritized list of potential safety concerns at 40 overpass and underpass locations within the City of Saskatoon. Given the volume of data anticipated during the field audit, an interactive GIS database was created to document findings and share results.

Operational and safety concerns were identified through a desktop review of each site, a review of collision data, and a review of current applicable design guideline documents. A field audit was conducted by transportation planning staff with Road Safety Auditor (RSA) experience and urban planning staff with CPTED experience. The field audits took place under a variety of lighting conditions, allowing the team to experience potential issues related to lighting levels first hand. A risk assessment was completed for each site using an aggregate of data collected in the field and weighted by severity and frequency of exposure to hazards. This report pairs site concerns with recommended solutions. which may include changes to signing or geometric changes to the overpass and underpass structures and surrounding road network.

2.2 Active Transportation in Saskatoon

The ages of the overpass and underpass structures vary significantly across the City of Saskatoon. The CP Railway Bridge was constructed in 1908 and is one of the oldest bridges in Saskatoon. The bridge connects the Meewasin Trail to the University of Saskatchewan and is constructed with timber beams. The new Traffic Bridge, originally one of the oldest bridges in Saskatoon, recently reopened to public in 2018 and includes a variety of AT features including dedicated facilities for all users and raised cycle track on Victoria Avenue for cyclists. The sites audited during this study span over 100 years of path design and as a result were constructed with a wide variety of design guidelines and safety standards. With the growing momentum of Vision Zero and the Safe Systems approach to transportation, the City of Saskatoon is making increased investments in AT user safety.

The City of Saskatoon has embraced active transportation as a means to diversify transportation options available to local residents by expanding their commuter and recreational path network. Investing in active modes of transportation can promote healthy communities and provide equitable travel to all. The Meewasin Trail provides an extensive shared use path network throughout Saskatoon. Recent AT initiatives have included the re-opening of the Traffic Bridge, the protected bike lane pilot program downtown, the Blairmore Bikeway, and the Evergreen pedestrian bridge over McOrmond Drive. In time, these projects will be bolstered by Imagine Idylwyld, additional bike lanes, All Ages and Abilities (AAA) corridors, and other planned pedestrian bridges.

City Bicycle Bylaw No. 6884 Sections 20 and 21 establishes the legal operation of cyclists on bridge crossings. An excerpt from the bylaw is included below:

> "20. In traversing any bridge or river crossing a person operating a bicycle may:
> (a) subject to Section 22, utilize that portion of the bridge or river crossing as is intended for the passage of motor vehicles; or,
> (b) notwithstanding any other provision hereof, utilize the sidewalk portion of any bridge or river crossing.
>
> 21. In traversing any bridge or river crossing upon the sidewalk as provided in Section 20(b), every person operating a bicycle shall:

(a) proceed with due care and attention and with reasonable consideration for all pedestrians; and,
(b) yield the right of way to all pedestrians; and,
(c) dismount and walk the bicycle when passing a pedestrian proceeding in the same direction upon such sidewalk."

The current bylaw does not provide any context for width of path as it applies to dismounting when passing pedestrians.

Some changes to the Bicycle Bylaw are expected to come into effect following approval by Council in early 2020. Changes are expected to include a requirement that cyclists 14 and over may only use the sidewalk if a shared use sign is posted and allow cyclists to occupy an entire lane of travel on roads. The changes to the bylaw will include removing the current wording that requires cyclists to dismount while passing pedestrians on a bridge sidewalk.

2.3 Reference Material

Many manuals were used to develop an inclusive audit form and context-appropriate recommendations. Reference material is separated generally into two categories, audit resources and design guidelines.

Audit Resources:

- Active Transportation Plan (City of Saskatoon)
- Safety Audit Booklet (City of Saskatoon)
- 2018 Average Annual Daily Traffic AADT Report (City of Saskatoon)
- Bicycle Road Safety Audit Guidelines and Prompt Lists (Federal Highway Administration, Safer Roads for Safer Futures, and Road Safety Auditors)
- CPTED Audit & Site Assessment Checklist (Chicago Metropolitan Agency of Planning)
- Pedestrian Safety and Mobility Guide (American Association for Retired People, Institute of Transportation Engineers)
- Shared Path Audit Guidelines (Vic Roads, Australia)
- Highway Capacity Manual, 6th Ed. Approach to Multimodal Level of Service (Transportation Research Board)

Design Guidelines:

- City of Saskatoon Design Standards (Version 11)
- Geometric Design Guide for Canadian Roads, 2017 (Transportation Association of Canada)
- Manual of Uniform Traffic Control Devices for Canada, 5th Ed. (Transportation Association of Canada)
- Toronto Trail Design Guidelines (City of Toronto)
- Urban Bikeway Design Guideline (National Association of City Transportation Officials)
- Don't Give Up at the Intersection (NACTO)
- Designing for All Ages and Abilities (NACTO)
- Review of Collision Prone Intersections (City of Richmond)
- Grade Crossing Standards (Transport Canada)
- Ontario Traffic Manual Book 18 – Cycling Facilities (Province of Ontario)

- Safety Performance Functions for Bicycle Crashes in New Zealand and Australia (Turner, Wood, Hughes, and Singh)
- Drivers overtaking bicyclists: Objective data on the effects of riding position, helmet use, vehicle type and apparent gender (Walker)
- Dark Sky and Energy Efficient Lighting Community Handbook (Strathcona County, Alberta)

2.4 Applicable Standards and Guidelines

There are several documents with standards for facilities that accommodate pedestrians and cyclists. This section will discuss the available standards and note which may be appropriate for consideration as part of this study as they pertain to the various elements considered during the audit.

2.4.1 The City of Saskatoon Design and Development Standards Manual

The City of Saskatoon Design and Development Standards Manual (Version 11) includes a section on Bikeways. It notes that cyclists shall be accommodated on all roadways and goes on to state that the basic considerations for establishing bikeways are safety, aesthetics, destination, system continuity, and cost. It breaks down bikeways into three classes. The classes and characteristics, quoted directly from the manual, are noted below:

- Class A: Shared pedestrian and bicycle use:
    - Cross-flows by motorists are minimized.
    - Typically found in parks.
    - Minimum width is 3.0 m.
- Class B: Restricted lane on a traveled roadway, exclusive bicycle use:
    - Through travel by motor vehicles or pedestrians is not allowed.
    - Vehicle parking is not allowed in this lane.
    - Cross-flows by motorists to gain access to parking facilities or associated land use is allowed.
    - Minimum width is 1.5 m.
- Class C: Shared lane on a traveled roadway, bicycle use designated by signs:
    - These routes do not permit bicycles exclusive use of a road surface since bicycles are in the general vehicular traffic flow.
    - Minimum width of vehicle lane is 4.5 m.

The main focus of this report is shared use paths. Therefore, Class A facilities will be the most common type of facility applicable to this study. However, in some cases, pedestrians and cyclists may be accommodated on separate facilities. Therefore, it is worth noting the other classes of bikeways that can be found in the City.

In Section 7.2 of the Design and Development Standards Manual, it notes that the design of bikeways should, as closely as practical, follow the criteria as established by TAC and the City of Saskatoon Active Transportation Plan Final Report. The City of Saskatoon Active Transportation Plan deals with high level planning elements, while the TAC Geometric Design Guide (GDG) deals with design elements. Relevant design information from the GDG is summarized in the following section.

2.4.2 Transportation Association of Canada Geometric Design Guide for Canadian Roads (June 2017)

The TAC GDG includes chapters on Pedestrian Integrated Design and Bicycle Integrated Design. In the Bicycle Integrated Design chapter, Section 5.3.1.4 includes information on multi-use paths. A multi-use path is defined as a roadside facility that allows for two-way, off-street shared use by cyclists and pedestrians. It goes on to note that segregation of pedestrians and cyclists on separate path sections is warranted in certain situations, and if so, the paths should be defined as two facilities. These situations where pedestrians and cyclists should be accommodated on separate paths include:

- Locations with a high percentage of pedestrians (greater than 20% of users) and total user volumes greater than 33 persons per hour per metre of path width, or
- Locations with a low percentage of pedestrians (less than 20% of users) and total user volumes greater than 50 persons per hour per metre of path width.

2.4.2.1 Width

TAC presents a design domain for the width of a shared multi-use path. The widths range from a practical lower limit to a practical upper limit of 2.7 m to 6.0 m respectively. The GDG does not give any guidance as to when the upper or lower limit of the design domain should be used. However, it can be inferred that the upper limit of the design domain becomes more desirable where pathways experience high bi-directional volumes of both pedestrians and cyclists, and where other operational challenges exist, such as sight distance constraints. It should be noted that these challenges can also be addressed by including directional dividing line pavement markings to clarify the operating space that is allocated to users travelling in each direction and separate opposing traffic, assuming adequate width is available.

2.4.2.2 Protection

In Section 5.7.6, the GDG notes that protective railings, fences, and barriers should be a minimum height of 1.05 m and a preferred height of 1.2 m to prevent cyclists from falling over the railing.

2.4.2.3 Vertical Clearance

Section 5.5.6 of the GDG deals with vertical clearance. A design domain is presented for vertical clearance between the highest point on the bikeway riding surface to the lowest point above the bikeway. The design domain includes a practical lower limit of 2.7 m and a recommended lower limit of 3.0 m. There are no values for the practical or recommended upper limit.

2.4.2.4 Grade

The GDG notes that there is no absolute maximum grade for bikeway facilities, but long steep grades tend to act as a deterrent to cyclists. Ideally, grades should be less than 4%. For grades less than 4%, typical uphill speeds are 10 km/h and downhill coasting speeds can reach 25 km/h. Cyclists will tend to dismount and walk when grades exceed 8%. Therefore, 8% can be considered the practical upper limit for grades on a bikeway. For steeper grades, warning signage should be posted as suggested in the Manual of Uniform Traffic Control Devices Section A3.4.3.

For pedestrian facilities, the GDG notes that a maximum recommended grade of 5% is appropriate. Steeper grades of up to 1:12 (8.3% inclusive of landings) are acceptable provided intermittent landings are provided at intervals of no more than 9.0 m.

3 AUDIT METHODOLOGY

Audits were conducted at all 40 sites in person during the day and night to capture the effects of lighting, visibility, and user vulnerability on safety and operational use. Each site was audited from the perspective of the pedestrian and cyclist. Auditors travelled the sites as cyclists on both the road and the pathway where applicable to gauge perceived safety for confident cyclists and for timid cyclists.

The audit was set up to collect data on existing gaps in infrastructure and highlight current successful practices that may be applied in other situations. Audit form questions were tailored to measure risk as quantitatively as possible. Safety is often perceived qualitatively by the public and a portion of the audit form aims to capture these perceptions at each site. The survey was broken down into three categories:

1. General Information,
2. Consistent Qualities, and
3. Variable Qualities

General Information was intended to capture basic reporting information including name of structure, date and time of audit, and weather conditions.

Consistent Qualities included physical features unlikely to be affected by time of day. This section aimed to capture any surface deficiencies, traffic control at pedestrian crossings, current signing practices, and compliance with current geometric guidelines.

Variable Qualities included geometric and built form features that may be impacted by time of day. Items like sightlines, visibility, and lighting were included in this section. Overall personal safety was included in this section for pedestrians and cyclists in all lighting conditions. It is important to acknowledge that risk to self is inherently biased by past experiences, gender, race, religion, sexual orientation, level of mobility, and many other aspects. Our audit team considered users of all ages and abilities throughout the audit and recommendation process; approach grades suitable for mobility devices and proximity of AT facilities to schools were among considered factors.

Auditors incorporated principles from Road Safety and CPTED audit methodologies into the study process, from audit form creation to determining appropriate recommendations. Suggested changes to road geometry and signing were principally founded in Road Safety Audit approach to design and operation. Collisions may be avoided, and operation of a facility improved, if unsafe physical features are altered. Using similar principles to a Road Safety Audit approach helped the auditors systematically assess each site to identify issues and recommend mitigating measures that will help the roadway and roadside geometry, traffic control, and pavement markings work together to create a safer system. The personal safety of a space is often more readily addressed by applying CPTED solutions to issues such as graffiti, sightlines and lighting. A space may passively reduce the instances of crime by increasing natural surveillance and using lighting, maintenance, landscaping, access control, and public art.

Field auditing was completed between October 10 and October 27, 2019. The audit form was prepared in Survey 123, a GIS-enabled data collection tool that allows each site entry to be tied to a GPS location and produces Microsoft Excel and Word formatted data sheets. The app was downloaded to each of the auditors' mobile devices and integrated with the camera to take photos of defects or concerns directly in the survey tool. Full audit results are provided in Appendix A as a flash drive due to file size constraints. Additional photos were taken outside of the app

and will be provided in a GIS database and flash drive. Screenshots of the Survey 123 interface are included in Figure 3-1.

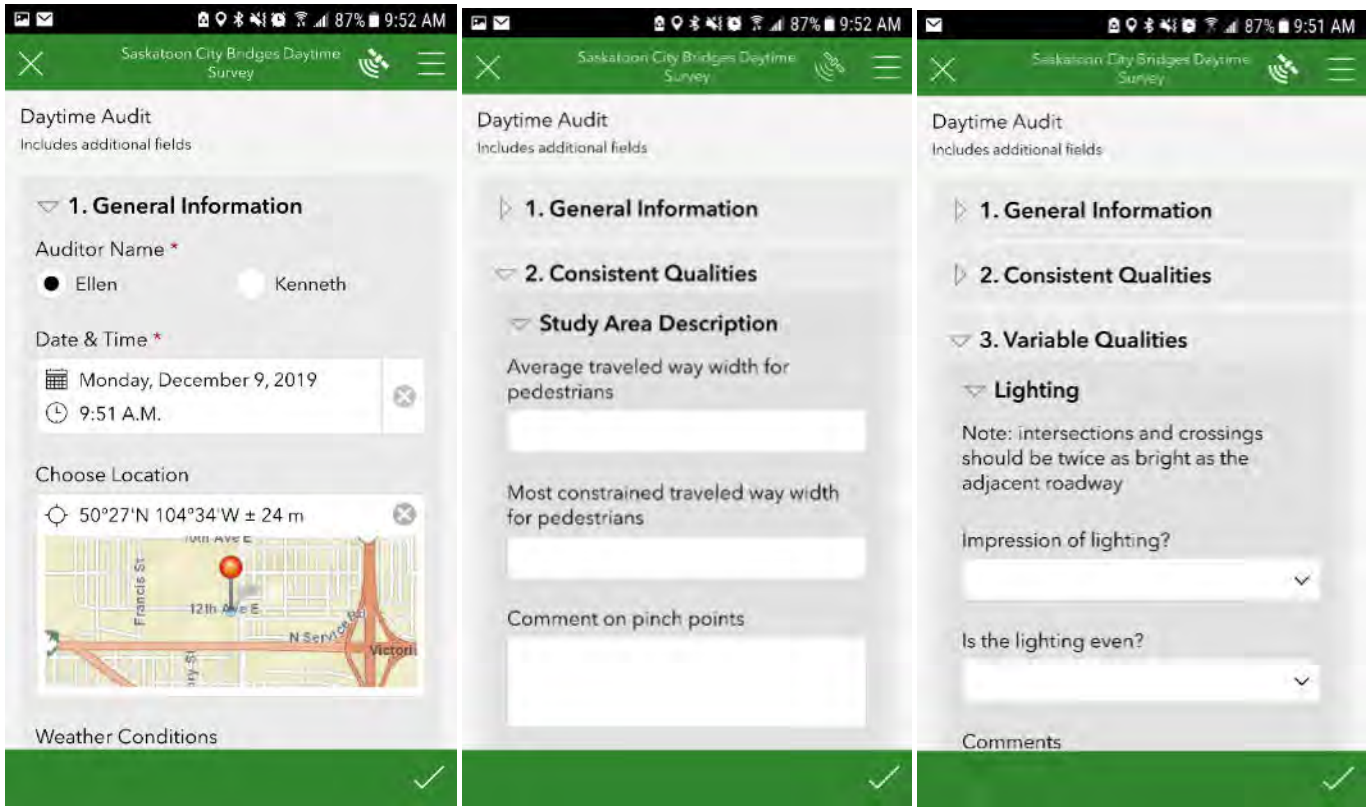

Figure 3-1
Survey 123 User Interface

4 COLLISION ANALYSIS

The City of Saskatoon provided vehicle / pedestrian and vehicle / cyclist collision history for the study area and nearby intersections for the past five years, 2014 to 2018. A total of 58 collisions were recorded at 14 sites within our study areas. Total facility user statistics are unavailable and as a result we are unable to contextualize the number of collisions with site use. A summary of collisions by location is illustrated in Figure 4-1.

Each report included data on location and lighting condition, vehicle type, user demographics, and position/orientation of vehicles in the collision. A summary of finding shows:

- That 80% of cyclist collisions and 78% of pedestrian collisions took place during daylight. SGI reports did not indicate lack of artificial light was a factor in those collisions that took place during the night, dusk, or dawn.
- Most collisions occurred in the right through lane of travel, the location closest to a crossing point where pedestrians and cyclists are most easily obscured by parked vehicles and where cyclists are most likely to ride.
- The observed demographics of the cyclist and pedestrian collisions indicates a nearly even split of collisions with female and male pedestrians, 42% and 58% respectively. For cyclists, 80% of collisions were male and 20% female.

The three intersections with the highest collision rates include:

- Arlington Avenue and Taylor Street (Site ID 13) – Five cyclist and one pedestrian collision occurred at the intersection prior to summer of 2018 when the intersection underwent geometric changes. Collision data is not available after geometric changes were implemented. Vehicle speeds are typically higher at this intersection due to the proximity of the freeway interchange.
- Avenue W North and 33rd Street West (Site ID 19) – Two cyclist and one pedestrian collision occurred at the intersection. Southbound left turning traffic has a double left turn lane that overlaps with the North/South pedestrian walk light.
- Arlington Avenue and 8th Street East (Site ID 12) – Two cyclist and seven pedestrian collisions occurred at a mix of intersection and mid-block locations. Many collisions occurred on separate sidewalks at the throat of private accesses. There are seven accesses between Arlington Avenue and the Circle Drive overpass.

Recommendations for each facility audited can be found in Section 7.

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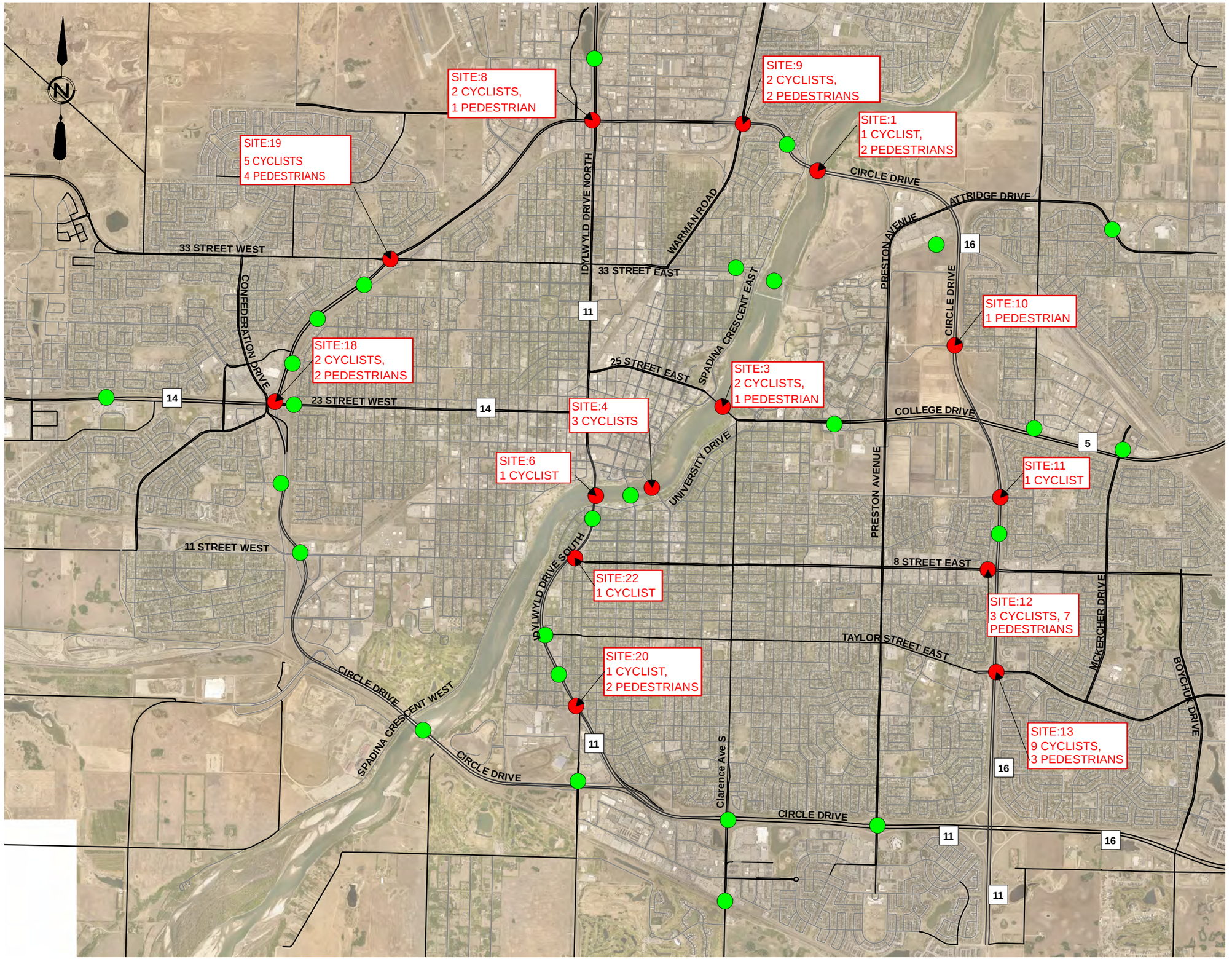

Associated Engineering

City of Saskatoon

LEGEND:

COLLISION HISTORY

- NO
- YES

FIGURE 4-1

CITY OF SASKATOON

TRANSPORTATION PLANNING
BRIDGE SHARED USE PATH AUDIT

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DATE	2019DEC16
REV	1
DESCRIPTION	ISSUED FOR REPORT

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5 RISK ASSESSMENT

A qualitative risk assessment method was developed that systematically combined collision history, field observations, and engineering judgement, resulting in a relative risk ranking of the 40 locations.

The risk assessment was broken into four main categories, which were then combined to create a single relative risk ranking. The four categories that comprise the risk ranking align with the framework that was used to collect data in the field:

- **Main risk rating** – based on collision history, degree of separation between pedestrians, cyclists and vehicles, width of narrowest point on traveled way, presence of buffer appropriate for roadway speed, presence of channelized right turns, whether approach radii are appropriate for cyclists, whether access management practices detract from safety, whether there is abrupt barrier end, lighting, sightlines and general impressions of safety for pedestrians and cyclists.
- **Cycling defects risk rating** – based on the number and severity of observed defects related to cycling infrastructure.
- **Pedestrian defects risk rating** – based on the number and severity of observed defects related to pedestrian infrastructure.
- **User experience risk rating** – based on additional user experience observations, such as whether users can cross safely at the bridge, relative visibility, total exposed crossing distance, whether bollards are present and whether they present a higher risk than motorized vehicles, continuity of paths, presence of refuge space at each end of the terminal crossing point, presence of ramps, safety measures applied and the number of cyclist/pedestrian conflict points present.

A full summary of risk factors and ranking is included in Appendix B.

For each risk rating in this study, field observations were converted into relative risk categories of low, medium and high, with thresholds for these ratings set using engineering judgement. For example, risk increases with increasing exposed crossing distance, or the number of channelized right hand turns at a location.

The number of collisions at each site over a period of five years (2014-2018) was included in the main risk rating to account for frequency of risk events at each site. Ideally, risk would be assessed in the context of number of interactions at each site, however this type of data is not available at all sites. Cyclist, pedestrian and vehicular traffic counts would provide additional context for collision information.

Each type of observation was weighted using engineering judgement to place emphasis on observation types that were associated with higher risk items, and then multiple observations were combined to produce a risk score for a category of risk at each location. Higher risk items include degree of separation of pedestrians, cyclists and vehicles, walkway space, roadway speed and presence of buffer, total crossing distance, whether or not users can cross safely at the bridge, and presence and size of refuge space at terminal crossing points.

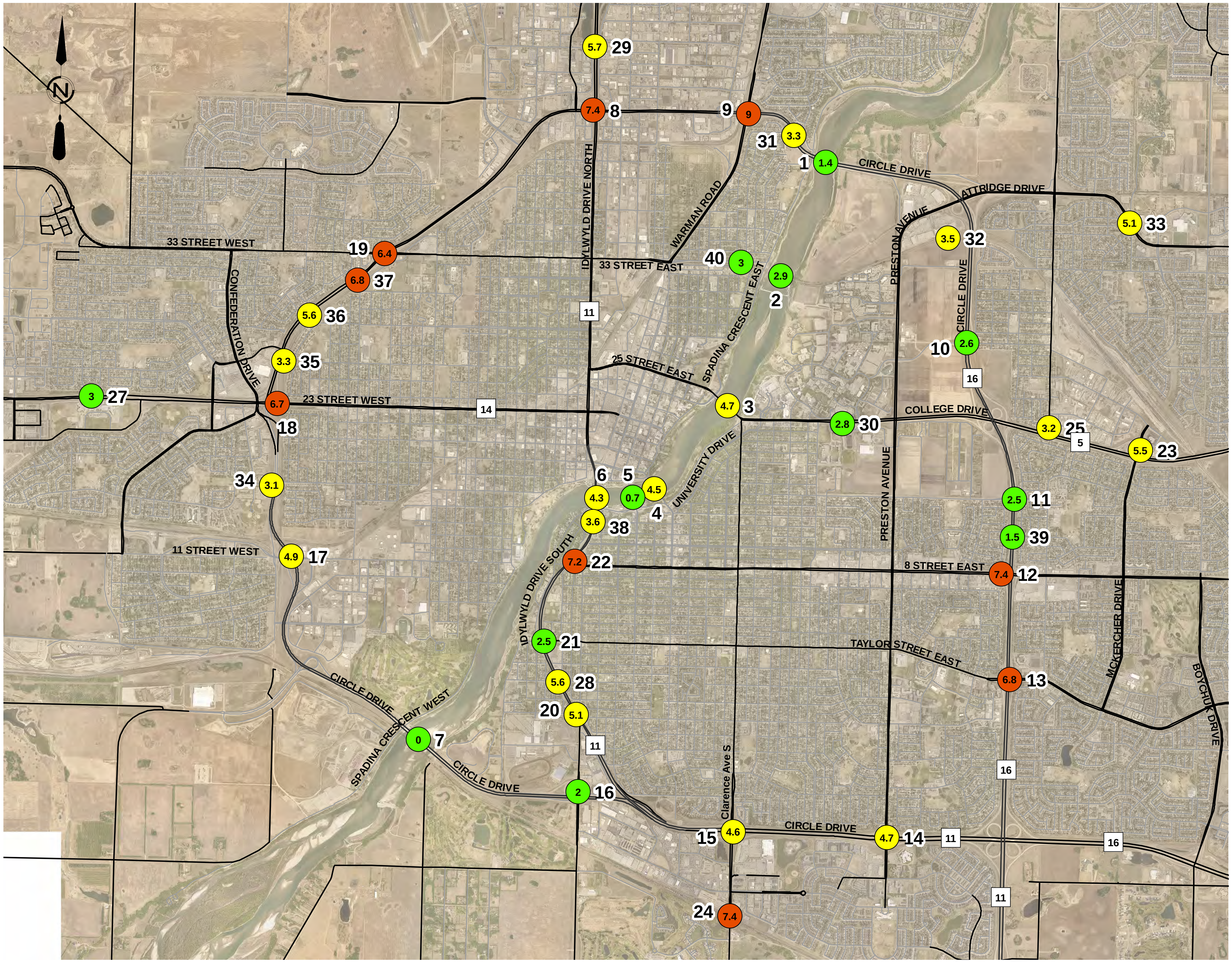
To obtain a final risk score, the four categories were combined, using a weighting that emphasized the main risk score, as the other observations were supplemental to each site. These combined scores were then converted to a nine-point scale with 9 as the highest risk score and 0 as the lowest risk score. These scores are relative values which are used only to make comparisons between sites in this study. A high score indicates high risk, and a low score indicates low

risk, but there is no quantitative comparison between points on the scale (that is, a site scoring at three does not necessarily have a risk that is three times higher than a site scoring one on the scale. The relative ranking of sites is shown in Table 5-1 below. Risk ranking is shown visually in Figure 5-1 on the following page.

Table 5-1
Relative Risk Ranking

Risk	Location	Location #	Risk	Location	Location #
Highest	Circle Dr & Warman Rd	9		Sid Buckwold Bridge	6
	Circle Dr & 8th St	12		Idylwyld Dr & 11th Street	38
	Clarence Ave S - railway	24		Circle Dr & Adolph Cr/Preston Crossing	32
	Circle Drive E & Idylwyld Dr N	8		Circle Drive & Pembina Pl/Rupert Dr	31
	Idylwyld Dr & 8th St / Lorne Ave	22		Circle Dr & Vancouver Ave	35
	Circle Dr & Edmonton Ave	37		College Dr & Central	25
	Circle Dr & Taylor St	13		Circle Dr & Clancy Dr / 18th St	34
	Circle Dr & 22nd St	18		33rd Street & 10th Ave (rail underpass)	40
	Circle Dr & 33rd St	19		22nd St by Shaw Centre	27
	Idylwyld Dr N by 45th St	29		CPR Bridge	2
	Idylwyld Dr by St Patrick Ave / Hilliard St	28		University and College Drive	30
	Circle Dr & 29th St	36		Circle Dr & 108th St	10
	McKercher Dr & College Dr	23		Circle Dr & 14th St	11
	Idylwyld Dr & Lorne Ave / Ruth St	20		Idylwyld Dr & Taylor St	21
	Attridge Dr & Rosso Rd / Forestry Farm Drive	33		Circle Dr & Lorne Ave	16
	Circle Dr & 11th St	17		22nd St W by Circle Dr	26
	University Bridge	3		Circle Dr & Harrington Cr/Lindsay Dr	39
	Circle Dr & Preston Ave	14		Circle Drive North / Stew Uzelman Pedway	1
	Circle Dr & Clarence Ave	15		Traffic Bridge	5
	Broadway Bridge	4	**Lowest**	Gordie Howe Bridge	7

Some judgement should be used to further contextualize the risk ranking based on other factors such as volume of traffic and/or volume of vulnerable road users. For example, the Clarence Avenue South rail crossing is ranked highly on this list due to poor crossing control and steep grades with little protection; but sees almost no use due to its location at the southernmost edge of the City. When prioritizing improvements, further consideration should be given to current and planned surrounding land use and latent demand.



Associated Engineering

BEST MANAGED COMPANIES Platinum member

City of Saskatoon

LEGEND:

RISK SCORE

- 0.0 - 3.0
- 3.1 - 6.0
- 6.1 - 9.0

SITE No. RISK

FIGURE 5-1

CITY OF SASKATOON

TRANSPORTATION PLANNING
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	1:38893
APPOVED	A. APPROVED
DATE	2020JUN23
REV	1
DESCRIPTION	ISSUED FOR REPORT

IF NOT 25 mm ADJUST SCALES

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE

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6 SYSTEM WIDE SOLUTIONS

The goal of all recommendations is that they are feasible and cost effective. During the field audits, several issues were noted that apply to multiple sites. The City may want to address these issues as opportunities present themselves, either on their own or combined with other projects. In the following paragraphs, we have provided information on current guidance or best practices, supplemented with examples of what other municipalities have done. The application of these recommendations is addressed by site and deficiency in Section 7.

6.1.1 Enhanced Pavement Markings at Shared Use Pathway Crossings

The visible presence of cycling infrastructure helps both cyclists and pedestrians safely and confidently navigate crossing areas and provides additional warning for motorists of the crossing area. The Toronto Multi-Use Trail Design Guidelines illustrates four basic types of trail "crossrides", the term used to describe pavement markings at trail crossing points. Each crossing treatment is illustrated in Figure 6-1 below.

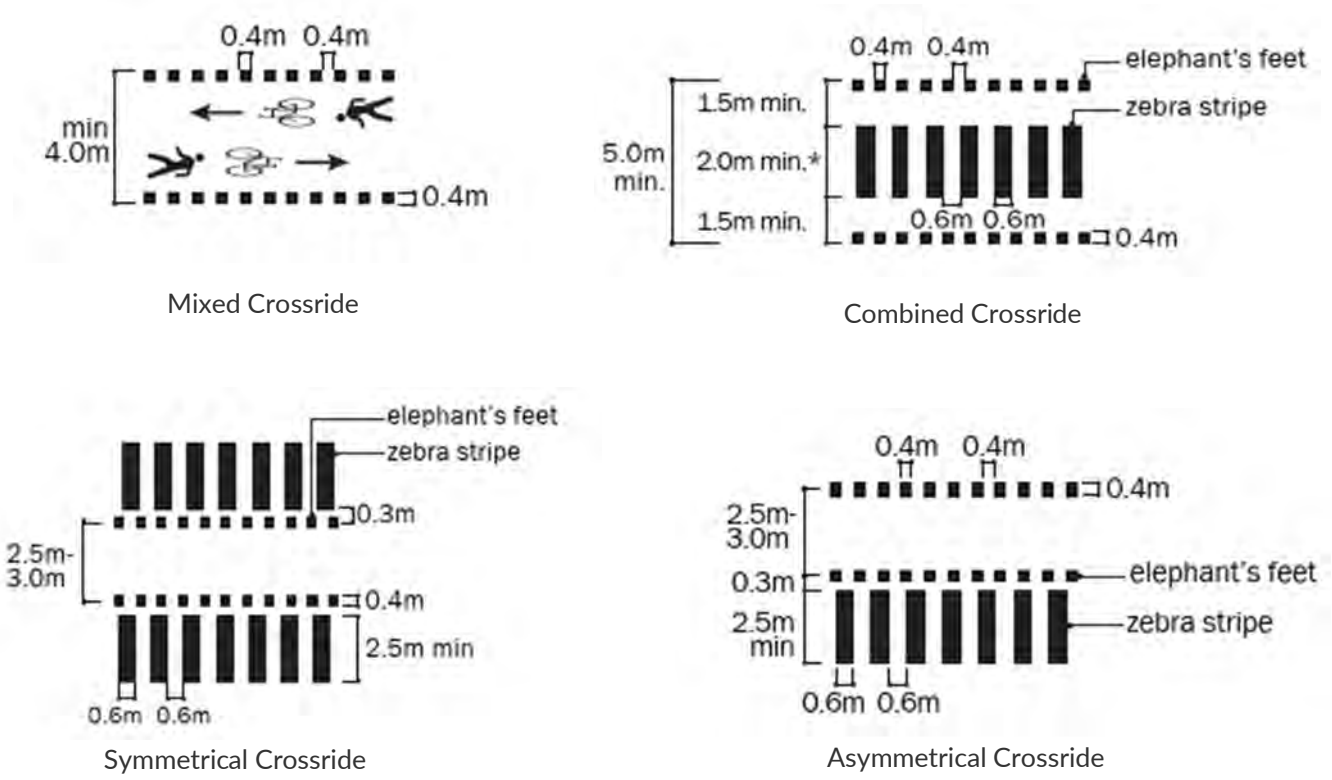

Figure 6-1
Cross Ride Variation and Classification

Source: Toronto Multi-Use Trail Design Guidelines, City of Toronto

The asymmetrical crossride has been implemented by the City at Victoria Avenue and 11th Street E just south of the Traffic Bridge, illustrated in Figure 6-2. Enhanced crossrides, where the pavement is painted green, are commonplace on many bike path crossings in Canada, and are recommended for enhanced visibility at conflict points. One such

application is illustrated in Figure 6-3 as part of a bike lane and bike box intersection treatment. Throughout this report, crossride refers to a mixed crossride enhanced by green pavement paint unless explicitly stated otherwise.

Figure 6-2
Victoria Avenue and 11th Street E

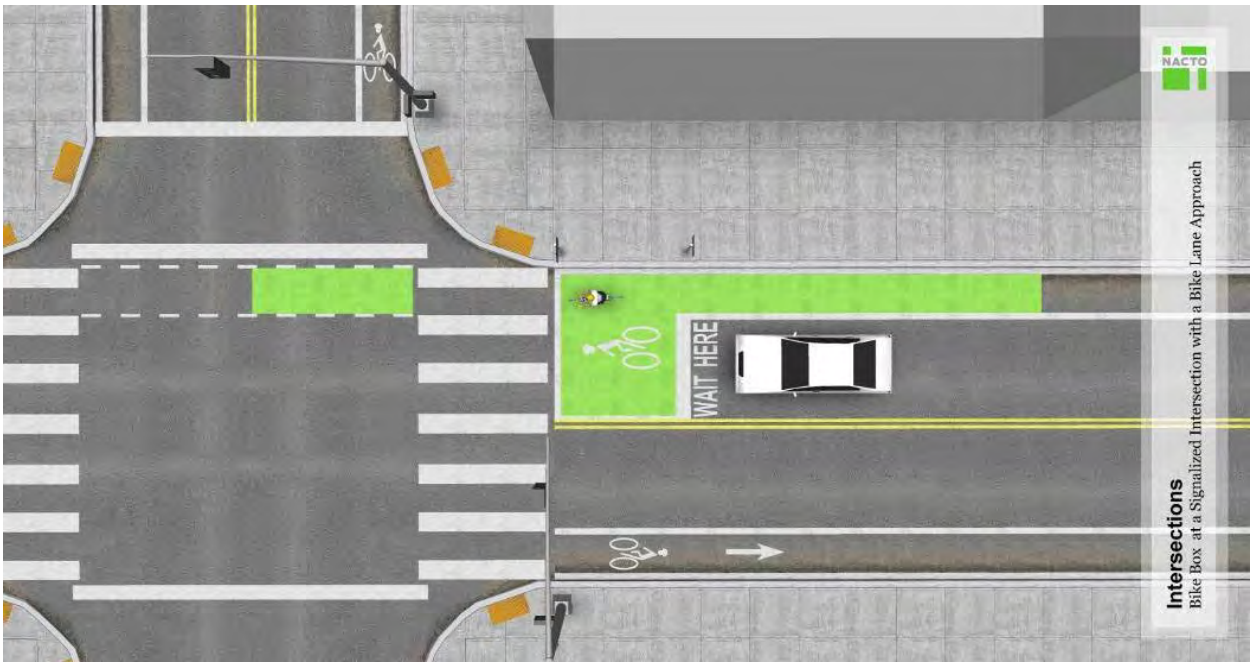

Figure 6-3
Enhanced Asymmetrical Crossride

Source: Urban Bikeway Design Guide, NACTO

NACTO notes that "high-visibility ladder and zebra [...] crosswalk markings are preferable to standard parallel or dashed pavement markings. These are more visible to approaching vehicles and have been shown to improve yielding behavior." In addition, higher visibility crosswalks are easier to navigate for sight impaired individuals. By placing the stripes to avoid wheel paths, a reduction in maintenance costs is realized.

6.1.2 Right Turn Channelized Treatment

Channelized lanes are designed to allow for a free flow of right turning traffic yielding to the traffic flow through the major intersection. The Federal Highway Administration (FHWA)[1] and supporting best practices documents from 2008 supported the implementation of channelized right turns noting that it reduces crossing distances for pedestrians and provides a refuge island for low mobility users. More recent publications including the FHWA PedSafe Pedestrian Safety Guide Countermeasures Selection System[2] acknowledge right lane channelization leads to a higher velocity turn designed to improve traffic flow; however, channelized right turn lanes create unsafe turns where the driver of the vehicle is focused on incoming traffic through the intersection rather than pedestrian traffic. The FHWA Pedestrian document provides the following design modifications at channelized right turn lanes to design safer crossings for pedestrians:

- Ensure all islands are large enough to accommodate pedestrians and include accessibility features (Curb ramps or cuts),
- Orient the crosswalk at a right angle to the travelled lane,
- Apply high visibility pavement markings such as zebra stripes,
- Where applicable, install raised crosswalks as a method of traffic calming and increased pedestrian visibility,
- Install RB-38 "turning vehicles yield to bicycles and pedestrians" sign where right turning vehicles intersect with a declared shared use path. Install RB-37 "turning vehicles yield to bicycles" sign where right turning vehicles intersect with dedicated cyclist facilities.
    - With the exception of high-speed ramps where RB-40 "bicycles yield at high speed ramps" should be used.
- Realign entry angle to decrease skew and manage vehicle speeds.

Where it is impossible or not appropriate to remove channelized right turns altogether, a high-entry angle island, or "smart channel" may provide a compromise between vehicle operation and pedestrian safety. Alternative right turn geometry is illustrated in Figure 6-4.

[1] FHWA Signalized Intersection Safety Strategies
https://safety.fhwa.dot.gov/intersection/other_topics/fhwasa08008/sb2_improve_rightturn_channel.pdf
[2] FHWA PedSafe Pedestrian Safety Guide and Countermeasure Selection System
http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=24

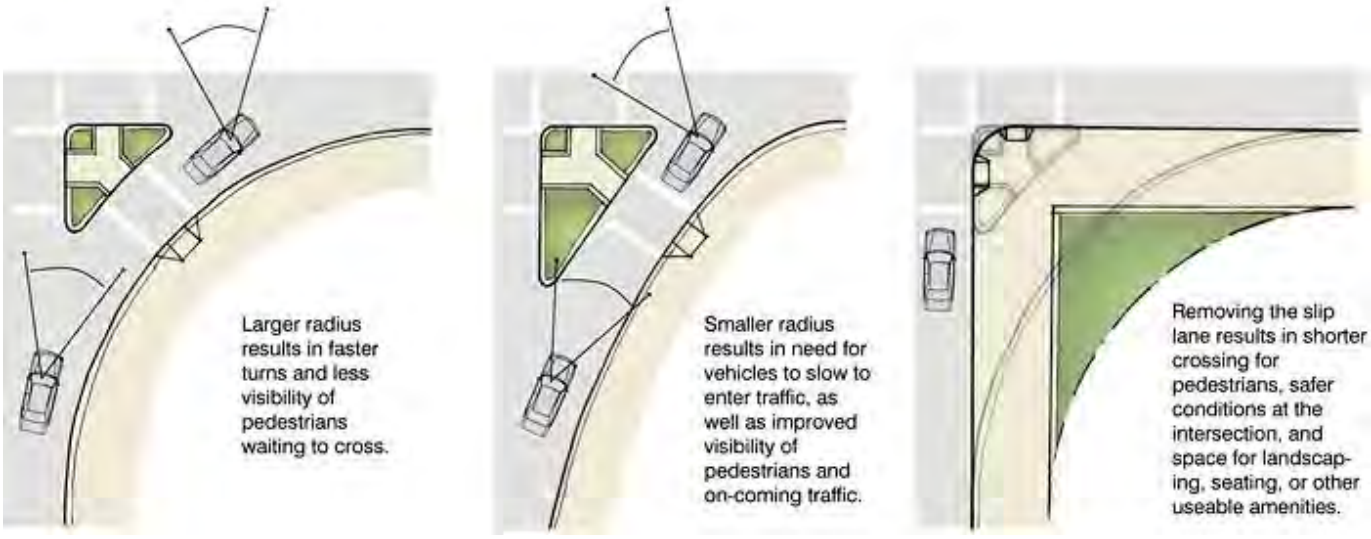

Figure 6-4
Right Turn Lane Geometry

Source: SFbetterstreets.org, Government of San Francisco

An example of a raised crosswalk in a channelized right turn is illustrated in Figure 6-5.

Figure 6-5
Raised Crosswalk at Channelized Right Turn

Source: Richard Drdul

We understand the City has begun to implement high-entry angle islands at new build locations on McOrmond Drive north of Fedoruk Road. It is recommended that the City investigate the impact of high-entry angle islands or smart channels further at retrofit locations and implement them in place of conventional channelized right turns where pedestrian crossings exist.

6.1.3 Underpass and Overpass Rejuvenation

Pedestrian underpasses and overpasses represent 40 % of structures audited as part of this study. Locations are typically concrete and usually show mild to moderate signs of graffiti. Generally, these structures connect local neighbourhoods over major arterial roads or freeways; these local connections generally lack the natural surveillance available at a typical crossing location. The City may consider a combination of community initiatives to give life and vibrancy to these locations through the installation of public murals. Murals can act as way-finding or be tailored to unique community history and culture. Local artists and community associations may be interested in coming together to create and maintain these projects. Figures 6-6 and 6-7 illustrate example art.

Figure 6-6
Pedestrian Bridge Public Mural, Jersey City

Artist: "Jessie and Katey", http://www.jessieandkatey.com/

Figure 6-7
Pedestrian Underpass Public Mural, CN Rail, Toronto

Artist: Rob Matejka and Anthony DeLacruz, https://muralroutes.ca/mural/rainbow-underpass/

6.1.4 Radii at Curb Ramps

Cyclists are often required to use sidewalks as AT facilities on bridges when dedicated facilities are not provided and sharing the road with vehicles is not suitable. Sharp radii common to standard curb ramps at intersections or bridge approaches can be considered difficult to navigate on a bicycle at speed, especially for new or nervous riders, and shoulder checking must be performed at a skew which affects a cyclist's balance and control. Where possible, opportunities should be considered to reduce radii on sidewalks and paths that are signed as shared use facilities. This may be accomplished in a number of different ways including separating sidewalks or creating a small landing or queueing zone to help cyclists align themselves to their desired direction of travel when they are preparing to cross a road. Refuge and queueing spaces are illustrated in Figure 6-8 and 6-9.

Figure 6-8
Manek Rd and Pedestrian Overpass

Figure 6-9
Victoria Ave and Spadina Cres. East

Source: Google Maps

6.1.5 Cyclist Calming Policy at Narrow Paths

Discussions with the project team revealed that the City does not currently have a dismount policy for cyclists at crossings with restricted widths. Bollards of varying design have been installed at pedestrian tunnels to help control the speed of cyclists at these locations. Bollard placement ranged from path shoulder to path centreline, Figures 6-10 and 6-11 respectively. High-visibility bollards placed near the path shoulder acted as natural traffic calming and provided a visual queue for the narrow path ahead. Bollards placed in the centre of the path may serve as trip hazards of individuals will vision impairment, limited comfortable maneuverability for mobility devices, and were often installed within the cyclist operating envelope.

Figure 6-10
Bollards Installed on Path Edge

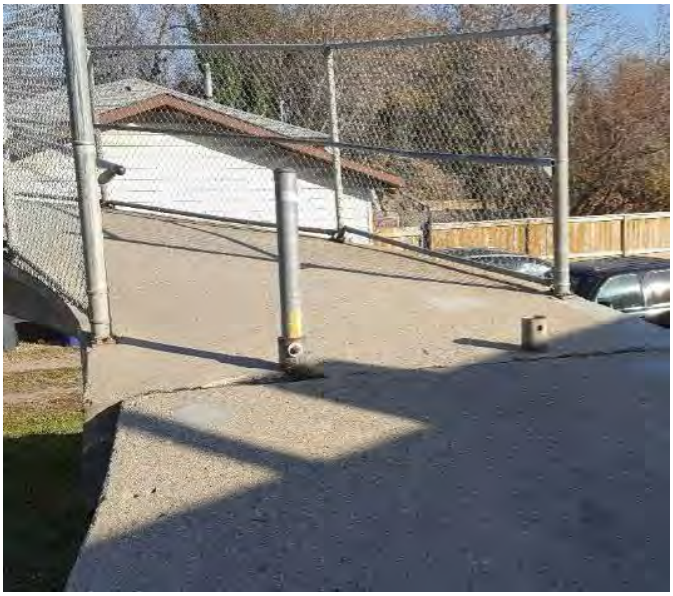

Figure 6-11
Bollards Installed near Path Centre

It is recommended that the City develop a traffic calming policy that combines cyclist dismount signs and wide set, high-visibility bollards where the path width is narrower than 1.8 m to reduce the risk of a pedestrian/cyclist collision. Once the policy is in place, signs are recommended to indicate to cyclists that they should dismount at these locations.

6.1.6 AT Guide Signing

As the City's cycling network expands it will be important to sign paths to provide direction for users. At this time, AT guide signs are most appropriate at path intersections on the Meewasin Trail, the Blairmore Bikeway, Victoria Avenue Cycle Track, and other shared use routes throughout the City. Meewasin Trail trailheads have excellent macro -level guide signing, showing a large area of path network. Signs similar to those illustrated in Figure 6-12 and 6-13 are suggested at multi use path intersections at various project locations and City-wide outside the scope of this study.

Figure 6-12
AT Guide Signs, Portland

Figure 6-13
AT Guide Signs, Saskatoon

Source: Richard Drdul, Ellen McLaughlin

Ensuring signs are human scale, at an appropriate height and font size for pedestrians and cyclists, will increase effectiveness. In many cases throughout the City, signs are an appropriate font size but placed above the natural line of sight for AT facility users. Placing signs according to MUTCD standard for mounting height is recommended.

6.1.7 Rail Crossing Treatment

Rail crossing treatment guidance varies depending on a number of factors including path proximity to road, and type of roadway crossing control. Some rail crossings within the study do not conform to the latest standards published by Transport Canada.

Table D-1 of the Grade Crossing Standards and Article 26 of the Grade Crossing Handbook outline the warning systems requirements for public grade crossings adjacent to roadways. Where no gate is installed for vehicular traffic, “maze barriers and guide fencing are designed to channel pedestrian movements to a designated crossing area and limit the number of potential pedestrian-rail conflict points. Fences are used to create a "maze" that slows cyclists as they approach the crossing.

“Proper channelization maximizes the likelihood that pedestrians will use a crossing as intended. Channelization treatments must be installed in such a way that pedestrians (or cyclists) are not able to easily circumvent them.”

Detectable warning strips or tactile panels the full width of the trail on both sides located 1.0 m from the channelization or fence may also be considered at crossing points according to the Handbook.

Some crossing areas in the project and outside the scope of this study do not have gates and current channelization does not adequately deter shortcutting or circumvention. Auditors witnessed cyclists bypassing channelization by travelling counterflow on an arterial road shoulder. The City may want to consider upgrading crossing areas that do not have gates to meet current crossing standards. An example of an existing crossing that does not appear to meet current standards is shown in Figure 6-14. Evidence of shortcutting can be seen in the boulevard adjacent to the path. A channelized crossing that is better-designed to eliminate shortcutting can be seen in Figure 6-15.

Figure 6-14
11th Street West Grade Crossing

Figure 6-15
Channelized Crossing – Grade Crossing Handbook

Source: U.S. Department of Transportation, Federal Rail Administration

Alternatively, Section 12.1 of the Grade Crossing Standards elaborates on gates specific to sidewalks, paths or trails where a path is not adjacent to a road.

- Each gate arm must extend across the full width of the sidewalk, path or trail; and
- In the case of a sidewalk, path or trail that is less than 3.5 m wide, two lights are required on each gate arm located so that the lights are over the two points dividing the sidewalk, path or trail into thirds. The two gate arm lights must flash alternately.

This option would allow pedestrians and cyclists to use the path normally when no trains are present and prevent short cutting only when trains are present.

6.1.8 Bike Ramps to Sidewalk Access

The TAC GDG Sections 5.6.1.4 and 5.7.3 detail the use of bike ramp accesses to shared use paths. If bike lane design is not feasible due to the road facility features, then a transition to the roadside path should be provided. From Section 5.7.3 “Bikeway ramps should generally be constructed at an angle of no greater than 30°, with a maximum slope of 8%”. Current guidance does not provide a recommendation for parking restrictions but some restrictions are likely required to maintain sightlines. Examples of bike ramps in use in Canada are illustrated in Figures 6-16 and 6-17.

Figure 6-16
Bike Ramp at Bridge

Source: Richard Durdl

Figure 6-17
Bike Ramp at Boulevard

Source: https://therecord.blogs.com/take_the_lane/bicycle_advocacy/page/28/

6.1.9 Signal Detection and Bike Signals

Traffic detection at actuated signals is used to trigger traffic control changes for a specific approach. Detection can be provided by a variety of different technologies.

Based on observation, the City of Saskatoon typically uses induction loops, an older detection technology. In most cases, the limitations of detection system technology is that it cannot detect a bicycle. This can cause disruptions to traffic flow if the first vehicle queued at a signalized intersection is a cyclist as was observed by auditors. In many cases cyclists must either wait for a vehicle to arrive, run a red light, or dismount and trigger the pedestrian actuation. The upgrade and installation of bike appropriate detectors discourages red light running and promotes safe and predictable cyclist movement.

NACTO outlines the following typical locations and situations for bike-appropriate detectors:

- In the travel lane on intersection approaches without bike lanes where actuation is required.
- At intersections with bicycle signal heads and/or bicycle-specific phasing that are actuated.
- In bike lanes on intersection approaches that are actuated.
- In left turn lanes with actuated left-turn signals where bicyclists may also turn left.
- To increase the green signal phase on intersection approaches whose combined minimum green plus yellow plus all-red is insufficient for bicyclists to clear the intersection when starting on a green signal. Advanced bicyclist detection can be applied to extend the green phase or to call the signal.
- At clearly marked locations to designate where a bicyclist should wait.

Under current conditions, bike detectors should be installed in all existing bike lanes at actuated signalized intersections. As additional roadwork is completed throughout the City and more bike infrastructure is added, current detectors can be retrofitted with bike detectors to better align with the listed NACTO recommendations.

The City of Saskatoon has started to install cyclist activated traffic control including pedestrian activated push buttons at Clarence Ave and 14th St. Upcoming AAA projects are likely to include additional traffic control for cyclists.

6.1.10 Dark Sky Preservation

Many recommendations within this study include the installation of additional lighting. A substantial portion of our study locations are adjacent to natural areas, preservation and conservation of these areas is key to Saskatoon's continued beauty. Lighting should therefore be installed in a context sensitive approach and dark sky approved lighting should be installed in natural areas at a minimum and through the City as a best practice. Beaver Hills and Strathcona County, Alberta have assembled a community handbook[3] on dark sky lighting that may serve as a guide for sourcing and installation.

[3] Strathcona Country's Dark Sky and Energy Efficient Lighting Community Handbook

7 RECOMMENDATIONS BY SITE

7.1.1 Circle Drive North/Stew Uzelman Pedway

The Stew Uzelman pedway connects the Meewasin Trail on the east and west banks of the South Saskatchewan River and is suspended between the divided lanes of Circle Drive North. During the day the path has natural overhead light. The path only interacts with vehicles on the west end terminal at Spadina Crescent.

Observations

- Debris has accumulated at the east bridge abutment; the mural displays signs of graffiti. See Figure 7-4.
- An off-road river trails at south east switchback was observed. Cyclists may startle pedestrians when they emerge from trees.
- Trees and shrubs encroach on pathway to the south east, obscuring sightlines and restricting path width.
- Path on west side of Spadina Crescent between path to the Rupert Drive overpass and Prince of Whales Avenue curb ramp forces cyclists to enter curb ramp and intersection at a skew.

Recommendations:

1/7. Apply enhanced continuity lines and green paint in bike lane across intersection conflict zones.

2. Sidewalk repair is required at the southwest corner of Spadina Crescent and Pembina Avenue. See Figure 7-3.

3/8. Include elephants' feet at pedestrian crossings to create mixed crossride.

4. Provide additional lighting on Spadina Crescent under Circle Drive North.

5. Graffiti cleanup is required on AT signs at the west terminal. Preventative maintenance is required at bridge joints. Trip hazards are forming at the deck transition zones.

6. Widen path on west side on Spadina Crescent between Rupert Drive path and Prince of Wales Avenue curb ramp.

9. Post Shared Use signs (MUTCD RB-93) at entry to trail system.

10. Fill desire line at south west terminal by creating a wide radius directional path for cyclists.

11/12. Protective rail requires reinstallation at the south east switch back. See Figure 7-1.

13/14. Trim trees adjacent to path, review tree maintenance schedule adjacent to shared use paths.

15. General cleanup is required at the east underpass wall. Consider mural rejuvenation.

Outside of Scope:

- Improvements to path connecting Stew Uzelman pedway to Rupert Drive pedestrian overpass:
  - This path is consistently 8% to 12% grade which is difficult terrain for many cyclists and people using mobility devices, a switchback path network would make the facility safer and more accessible.
  - Short term – install sign warning cyclists and pedestrians of steep grade.
  - Long term - consider widening and regrading path.
  - Install RRFB flashers at Spadina Crescent crossing per Neighborhood Traffic Review once funding is approved.

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City of Saskatoon

LEGEND:
- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE N & STEW UZELMAN PEDWAY

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-1
Broken Hand Rail

Figure 7-2
Meewasin Guide Signs

Figure 7-3
Spadina Crescent Crossing

Figure 7-4
Mural and Debris

Figure 7-5
Bridge during Day

Figure 7-6
Bridge during Night

7.1.2 CPR Bridge

The CPR bridge is the second oldest bridge in Saskatoon at just over 100 years old. The old timber bridge is an iconic feature in Saskatoon providing a view of the weir and University of Saskatchewan. The structure is still owned and operated by Canadian Pacific Rail.

Observations

- The only access to the bridge is by three sets of stairs effectively barring persons who require mobility devices and requiring cyclists to dismount and carry their equipment. See Figure 7-7.
- Central stairs have been recently upgraded to include bike wheel ramps, assisting cyclists to access the facility.
- East stairs are made of worn timber. Wooden bike wheel ramps have collapsed in places. See Figure 7-8.
- The timber slats become slick in rain/frost conditions and run parallel with wheel path, creating an unstable wearing surface resulting in loss of control. Gaps in slats closely match Auditors' tire width. See Figure 7-10.
- Current path is narrower than shared use standards, at approximately 1.5 m on average. This is a very high use and high-profile heritage bridge, but it is uncomfortable to use especially when passing another user.

Recommendations:

16. Connect the shared use path on 33rd Street W with the north/south sidewalk under the rail.
17. Fill desire line for directional path connection at 33rd Street W
18. West stairs likely require rehabilitation work. When rehab is scheduled, consider either decommissioning stairs or purchasing the necessary land to create a switchback path designed for cyclists and people with assistive mobility devices.
19. Consider a "Cross Other Side" Sign (RB-73R) at west stairs intersection with Spadina Crescent to direct users to controlled crossing to north.
20. Graffiti cleanup is required on bridge railing mid-deck and Meewasin Trail sign on east path terminal. See Figure 7-9.
21. Add lighting at east stairs and Meewasin Trail signage. There is currently no lighting in this area which is a safety hazard in the evening when traveling up or down the stairs.
22. East stairs require immediate rehabilitation work. When rehab is scheduled, consider purchasing the necessary land to create a switch back path designed for cyclists and people with assistive mobility devices.
23. Replace wooden deck surface where slats run parallel to tires.
    Short Term: Consider retro-fitting a surfacing material that eliminates the longitudinal gaps. Install WC-45 "Slippery when wet for Bicycles" sign on all approaches onto bridge.
    Long Term: Widen path to shared use standards and upgrade material type to reduce slipping in wet or icy conditions. This may be phased once the main rail bridge requires substantial rehabilitation work.

Outside of Scope:

- Review application of Share the Road sign and transition zones city wide. Generally, this type of facility is only appropriate where speeds are closer to 30 km/hr.
- A structural assessment may be required prior to design and rehabilitation of the CPR bridge to ensure it can continue to support loading changes to path material type or width.

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

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City of Saskatoon

CPR BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-7
West Stairs

Figure 7-8
East Stairs

Figure 7-9
Graffiti on Deck

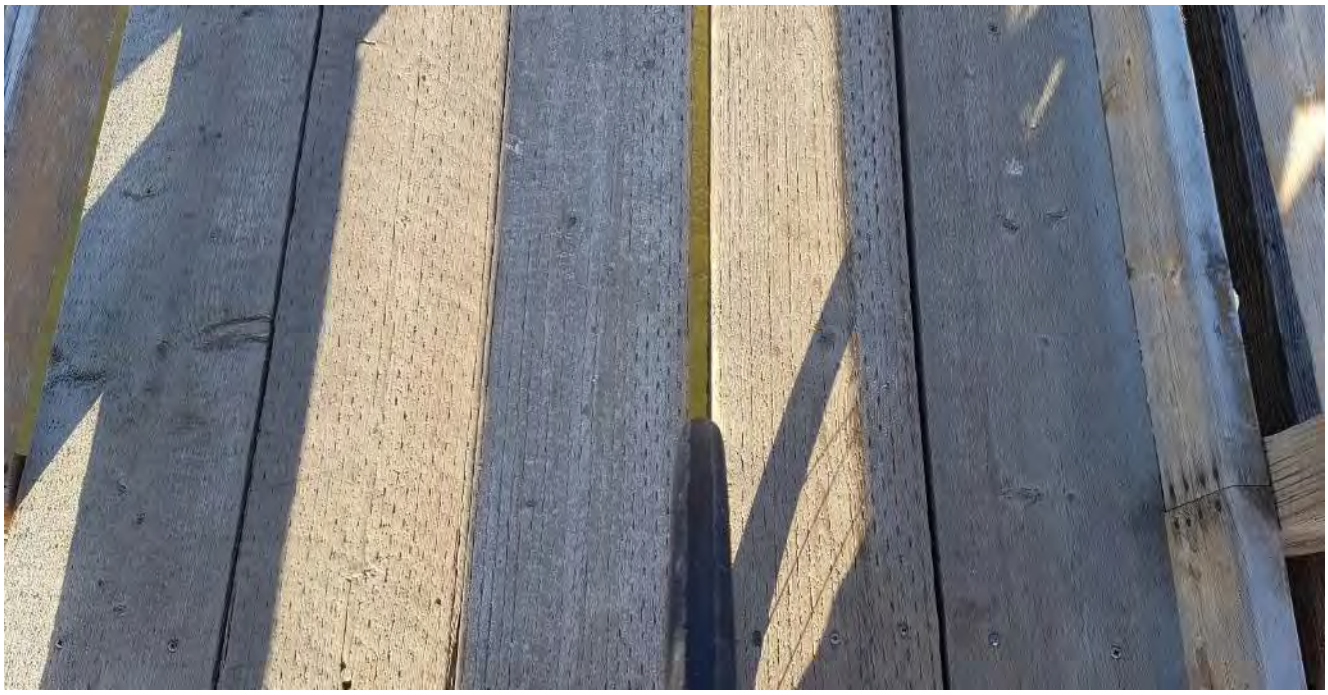

Figure 7-10
Gaps in Timbre Deck

7.1.3 University Bridge

The University bridge is the primary connection between the University of Saskatchewan and downtown services including the transit hub. College Drive has increasing access control east of the University Bridge. The bridge sidewalks are currently posted as shared use paths though they do not meet width standards. Due to roadway grade and vehicle volumes this is a preferable alternative to cyclists travelling on the road.

Observations

- Bike lanes end and start abruptly on Spadina Crescent with insufficient warning to cyclists or motorists. See Figure 7-12.
- High volumes of pedestrians have worn desire lines into landscaping on the east and west side of the bridge.
- Pedestrian facility is relatively close to traffic. See Figure 7-13.
- Pedestrians desire separation between themselves and high volumes of vehicles on College Drive based on desire lines and auditor observations of pedestrian behaviour. See Figure 7-14.

Recommendations:

Improvements to the intersection of Spadina Crescent and 25th Street E / College Drive:

24. Add a path at the desire line on the north west quadrant from curb ramp to park pathway.
25. Clean up debris under bridge and install additional lighting for day and night access.
26. Replace current AT guide signing on Spadina Crescent with shared use sign and “College Drive use bridge, Spadina Crescent use underpass” or a variation thereof. See Figure 7-11.
27. Create directional link to and widen underpass pathway to standard 3.0 m
28. Create a clear transition for cyclists from road to sidewalk using enhanced crossride treatment at ramp conflict zone and install bridge access bike ramps.
29. Install a raised crosswalk at the south west approach of Spadina Crescent to increase pedestrian visibility and act as a traffic calming measure.

Improvements to the intersection of College Drive and Clarence Ave / Saskatchewan Crescent:

30. Clean up debris under bridge.
31. Shared use signs are currently posted in eastbound direction of travel, post in westbound direction for those approaching the bridge
32. Install missing pedestrian pushbutton sign for east/west crossing at Clarence Ave.
33. Remove graffiti on sign on east side of Clarence Avenue.

Improvements to the intersection of College Drive and University Dr / Hospital Dr:

34. Work with University to replace current sidewalk and install separated shared use path from the bridge to the University. Realignment allows for landscaping along the corridor, a hearty vegetation or non-vegetative landscaping is recommended here due to debris from the roadway.
35. Realignment allows for the construction of pedestrian or cyclist queueing area at the north west corner of College Drive and Hospital Drive.
36. Enhanced crossride is recommended at the north approach of Hospital Drive as this is a shared use path.
37. Shared use signs are currently posted in eastbound direction of travel only. Post in westbound direction for those approaching the bridge

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City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

UNIVERSITY BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-11
AT Guide Signs

Figure 7-12
Bike Lane Ends

Figure 7-13
Actuated Crossing on Spadina Crescent

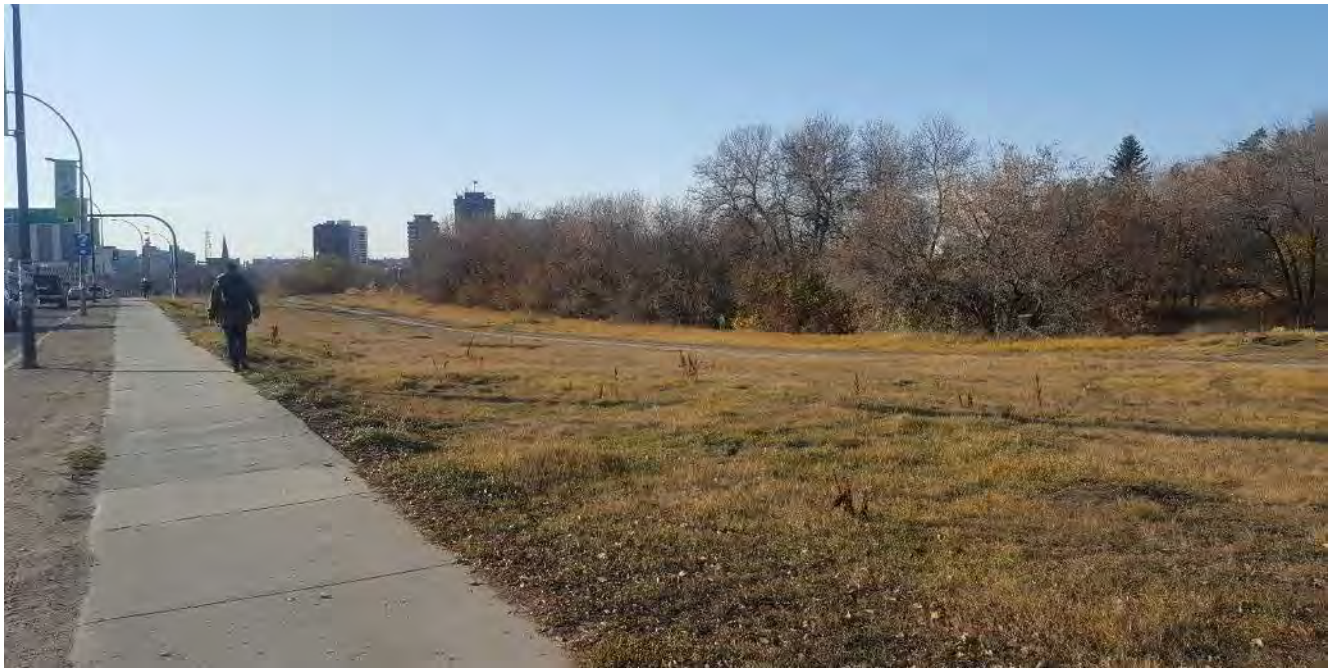

Figure 7-14
Separated Desire Line on College Drive

7.1.4 Broadway Bridge

The Broadway Bridge is a frequently used bridge connecting the downtown core to the Broadway and Nutana communities. The sidewalk on the south side of the river is declared a shared use path. The high amount of street furniture and public amenities in both the downtown and Broadway areas makes walking a pleasure but makes cycling much more difficult.

Observations

- The Broadway Bridge has a steep enough grade that cycling southbound can be difficult for some users; the existing bridge designation as a shared use path is appropriate. Both the downtown core and the Broadway area are more suited for cyclists to share the space available on the road once the appropriate facilities are in place rather than the sidewalk due to presence of street furniture and volume of pedestrians.
- Cyclists cannot safely switch from the sidewalk on the bridge to the road where they may ride more comfortably once they are clear of the river. Auditors observed cyclists hopping curbs and making unpredictable maneuvers to fill this gap. This occurs on both sides on the bridge though predominantly on the northeast sidewalk.
- Light poles protrude into the travelled pedestrian way, narrowing the effective walk width.
- There are inconsistencies between types of signs used throughout the City. For example, the Broadway bridge and the University bridge use two different “Cyclists yield to traffic”. While not necessarily a safety concern, uniform sign design and messaging using pictograms instead of words are highly recommended by the MUTCD. See Figure 7-15.

Recommendations:

38. Install bike ramps that transition cyclists from bridge to road in both directions.
39. Shared use signs are currently posted northbound. Post shared use signs southbound for those entering the bridge from the road or sidewalk. Clean existing signs of graffiti.
46. Additional maintenance, including tree trimming and additional fencing at bridge piers, may be required on the path under the south side of the bridge to deter undesirable activity; bridge showed signs of habitation.
47. Refresh paint markings at crosswalks on south side of bridge (RIRO locations); consider enhanced mixed crossride as the sidewalk is currently declared a shared use path. This will help to visually affirm the shared space dedication.
48. The pedestrian walkway does not meet the 3.0 m target for a shared use path width. Passing is manageable but awkward. When the bridge has been identified for a major rehabilitation, incorporate walkway widening into the work. This work should also include the relocation of light poles that obstruct pedestrians.

Outside of Scope:

- The Y-intersection at the north terminal does not accommodate any crossing for pedestrians. Conduct a traffic study at this location to determine the appropriate treatment and determine the MMLOS impacts of alternative intersection treatments including a multi-lane roundabout.

LEGEND:

- ● COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

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City of Saskatoon

BROADWAY BRIDGE & TRAFFIC BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-15
Variant Yield Sign

Figure 7-16
Bridge during Night

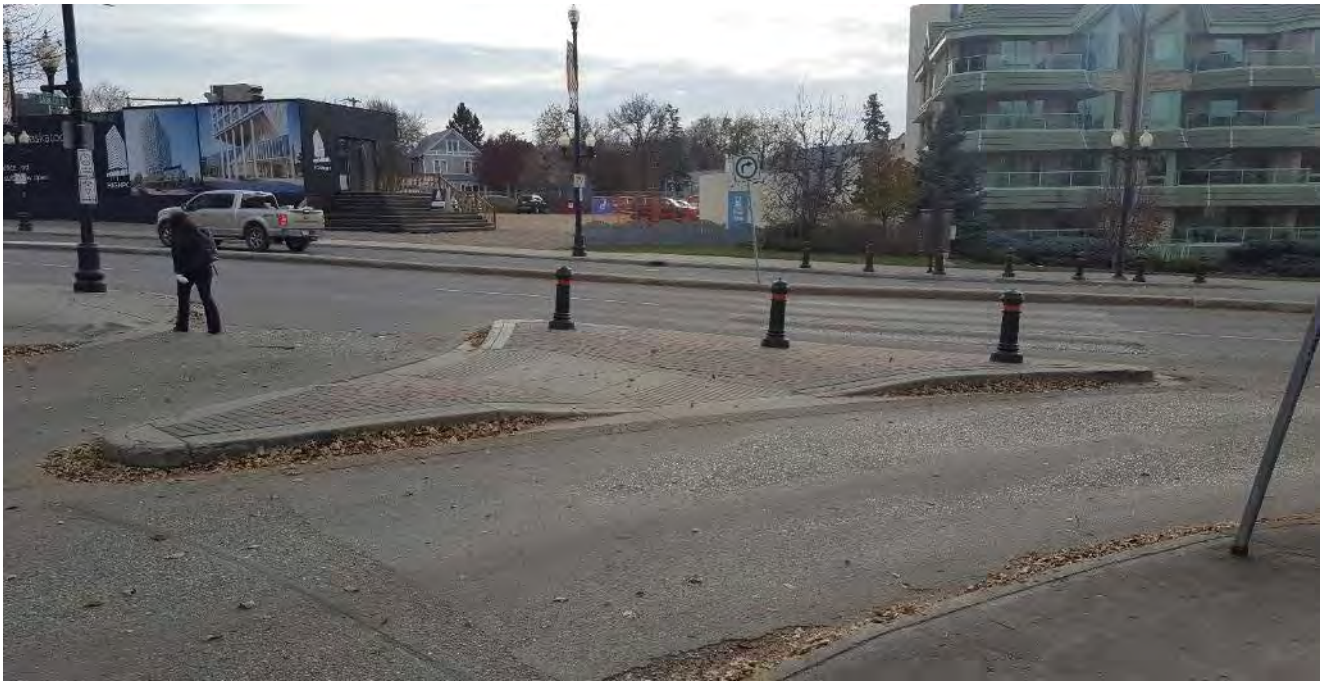

Figure 7-17
South RIRO

Figure 7-18
Northwest Desire Line and Curb Ramp – 19th St E at Friendship Park

7.1.5 Traffic Bridge

The Traffic Bridge is the newest of the structures audited as part of this study. Recently opened to the public in 2018, this bridge includes a wide shared use path on both sides of the structure and shared road space, so cyclists may choose to ride in an environment that suits their comfort level.

Observations

- Cyclists can safely transition from the shared roadway southbound to the separate cycle track by signaling. The northbound transition requires the cyclist to shoulder check and merge with traffic. See Figure 7-19.
- There are two unfilled desire lines through Friendship Park northeast of the Traffic Bridge that terminate at old curb ramps.
- Each leg of the roundabout to the north of the Traffic Bridge features unique pedestrian safety features including a raised crossing to the west, red tactile brick to the south, and painted crossings north and east.
- Asymmetrical crossride applied at Victoria Avenue and Saskatchewan Crescent provides visual affirmation of cyclist and pedestrian paths. See Figure 7-21.

Recommendations:

40. The diagonal link between the Broadway bridge and the Traffic bridge (and Meewasin Trail) will continue to be used regardless of regrading and replanting. A formalized path should be considered at this location.
41. A suitable sidewalk runs parallel to the north/south desire line in Friendship Park; speculation suggests this desire line developed while the roundabout on Spadina Crescent was under construction. Planting new grass is likely successful in discouraging shortcutting. The midblock curb ramps located at the terminal of this desire line may encourage shortcutting; if regrading and replanting is pursued this curb ramp should be removed.
42. Construction fencing to the northwest has encroached on pedestrians' operating envelope, forcing pedestrians closer to vehicles. Cleanup of construction debris and realignment of construction fencing is recommended in the short term. See Figure 7-22.
43. Pavement markings may be refreshed on the bridge deck and cycle track lanes. See Figure 7-20.
44. Asymmetrical crossride may be enhanced by painting bike conflict area green.
45. The "turning vehicles yield to bicycles and pedestrians" sign used at Victoria Avenue and Saskatchewan Crescent may be applied to other locations with a high volume of right turns at shared use paths.

Outside of Scope

- Apply additional crossing safety features on the north and east legs of the roundabout at 3rd Ave S and Spadina Crescent. A pedestrian study should be conducted once the new office towers are completed adjacent to the intersection to determine predominate pedestrian movements and appropriate crossing control.
- Though technically outside the scope of this study, the separated pedestrian, cyclist, and vehicle facilities at the south end of the bridge provide good separation allowing each mode of travel to safely climb the hill by removing conflicts. Noted numerous pedestrians using cycle track as extended sidewalk. Additional pavement markings may reinforce dedicated space.

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

Associated Engineering

BEST MANAGED COMPANIES

City of Saskatoon

BROADWAY BRIDGE & TRAFFIC BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-19
Vehicles Yield at Shared Use Path

Figure 7-20
Bike Lane Markings

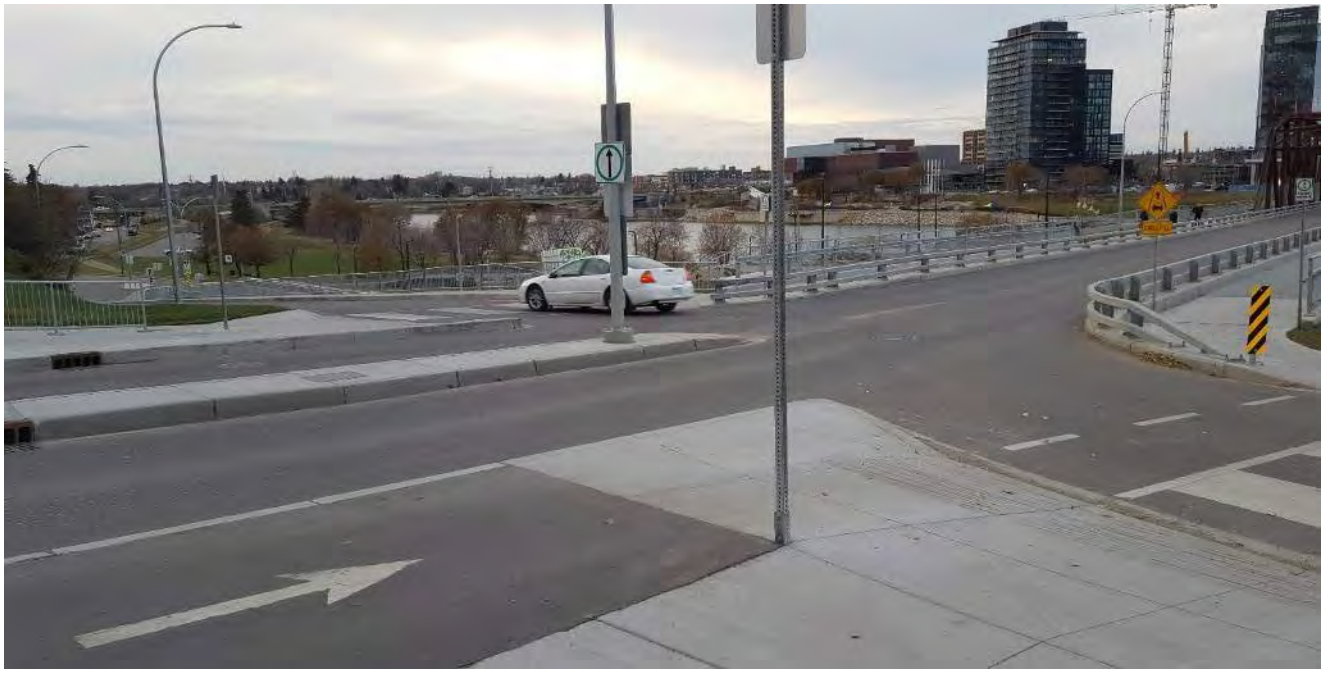

Figure 7-21
Intersection Treatment at Saskatchewan Crescent

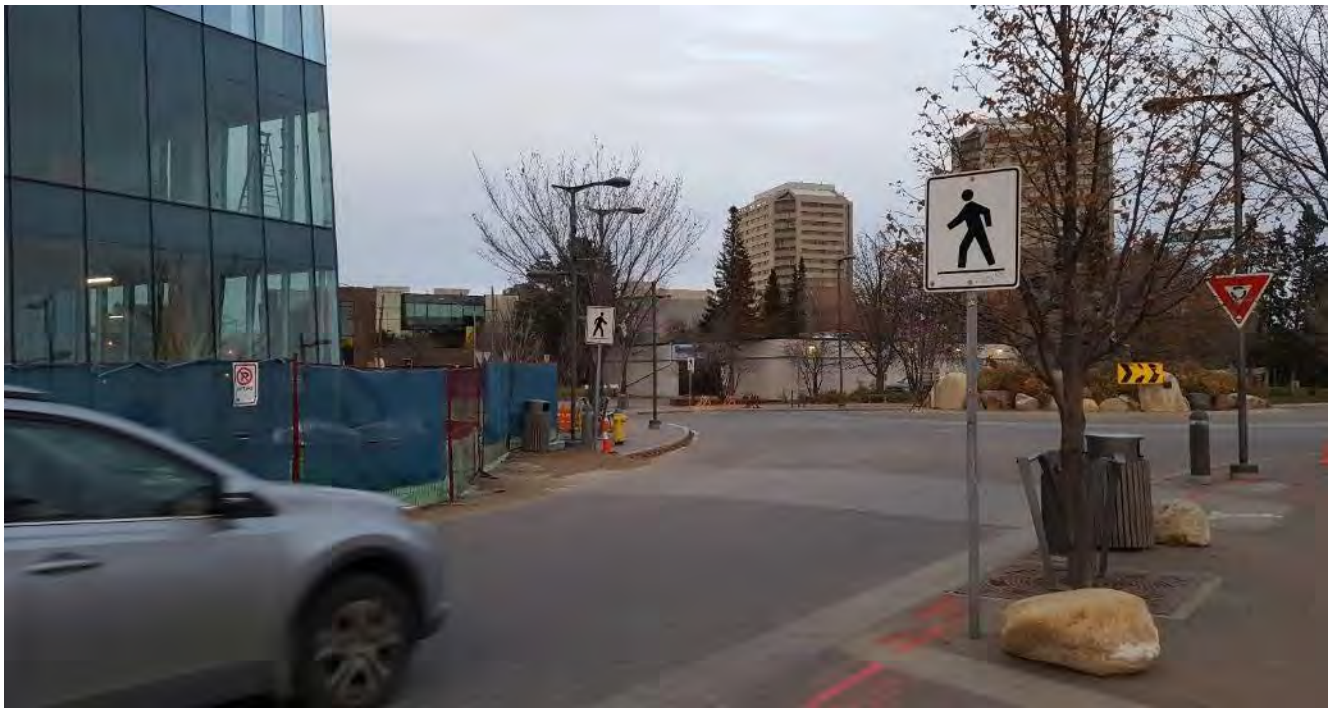

Figure 7-22
Intersection Treatment at Spadina Crescent

7.1.6 Sid Buckwold Bridge

The Sid Buckwold Bridge is a multimodal bridge that connects the extensive Meewasin Trail and bike routes on Saskatchewan Crescent to the downtown core, the local farmers market, and countless other amenities. The paths nearest this structure will tie into multimodal corridor improvements recommended in the Imagine Idylwyld study.

Observations

- There is a parking facility under the north side of the bridge that is likely used by pedestrians using the path network for recreation. The parking lot only connects to the path network via a short segment of stairs. See Figure 7-26.
- Paths are wide and accommodate passing with ease and curves are appropriate for bicycle wheel paths.
- Traffic calming at pinch point of Saskatchewan Crescent is effective at this location. See Figure 7-24.
- Spalling is beginning on bridge deck, monitor for deterioration. No action is required at this time. See Figure 2-25.
- Path and handrail are misaligned with ped ramp at Saskatchewan Crescent and McPherson Ave. Handrail position causes maneuverability issues for cyclists and persons using mobility devices. See Figure 7-27.
- There is a gap in the path infrastructure along the east side of Saskatchewan Crescent. Auditors noted pedestrians walking on both street and grass on Saskatchewan Crescent.

Recommendations:

49. Add a ramp appropriate for a mobility device next to the stairs connecting the public parking lot to the path.
50. Install AT guide sign with route options and connections at path diverge.
51/52. Replace burnt out lights.
53. Post temporary signs to warn users the south pathway is closed under the bridge during construction.
54. Installing an additional light at gap in illumination near vegetation.
55. Install additional lighting under bridge at Saskatchewan Crescent.
56. Post shared use signs NB for those entering the path network at McPherson Ave.
57. Remove and replace path leading to curb ramp at Saskatchewan Crescent / McPherson Ave. A section of path and handrail should be realigned with the center line of the curb ramp. A midblock curb extension would further reduce pedestrian crossing distance, a turning analysis for the design vehicle is required to ensure compatibility.
58. Connect path to east on Saskatchewan Crescent, filling desire line.

Associated Engineering

BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

SID BUCKWOLD BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
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Figure 7-23
Lighting on Path

Figure 7-24
Traffic Calming on Saskatchewan Crescent

Figure 7-25
Walk Deterioration

Figure 7-26
Desire Line to Parking Lot

Figure 7-27
Guardrail Blocking Curb Ramp

7.1.7 Gordie Howe Bridge

The Gordie Howe bridge is an AT bridge suspended under Circle Drive South connecting the Meewasin Valley Trail and Spadina Crescent. This is a relatively new structure, opening to the public in 2013. Unlike the Stew Uzelman bridge, this AT bridge is suspended under a four-lane undivided highway and has no access to natural overhead light during the day.

Observations

- The path intersection with Spadina Crescent is the first intersection with a public roadway within two kilometers of path trails. Additional warning for pedestrians and cyclists should be considered.
- Guide signing has faded significantly in both directions of travel on the path. See Figure 7-29 and 7-31.

Recommendations:

59. Refresh pavement markings with combined crossride at crossing.
60. Replace AT guide sign and post shared use signs for users entering the path in both directions.
61. Install tactile panels in walkway to warn users of conflict area and crossing.
62. Investigate bio-engineering slope stability to increase path jug handle on south side of road. See Figure 7-28.
63. Install additional light on path.
64. Reinstall broken AT guide sign at the path diverge on the northwest side of the bridge.
65. Post shared use signs northeast bound for users entering from the road.
66. Replace faded AT guide signs on south east path.
67. Extend fencing on path an additional 10 – 20 m past desire line to block access. See Figure 7-30.
68. Install additional lighting at stairs to illuminate hazards. Motion lighting may be considered as this is not as frequently used in the evenings.
69. Post shared use sign southbound for users entering from parking lot.
70. Install lighting at Meewasin Valley guide sign and seating area.

Figure 7-28
Bio-Engineering project in Grande Prairie (AE, 2019)

Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

GORDIE HOWE BRIDGE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
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Figure 7-29
Faded AT Guide Sign

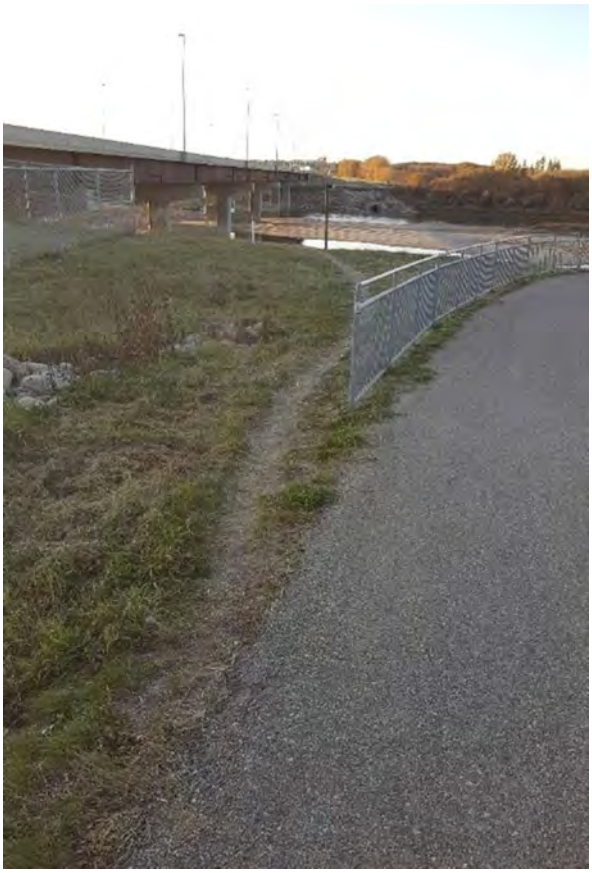


Figure 7-30
Desire Line to Bridge

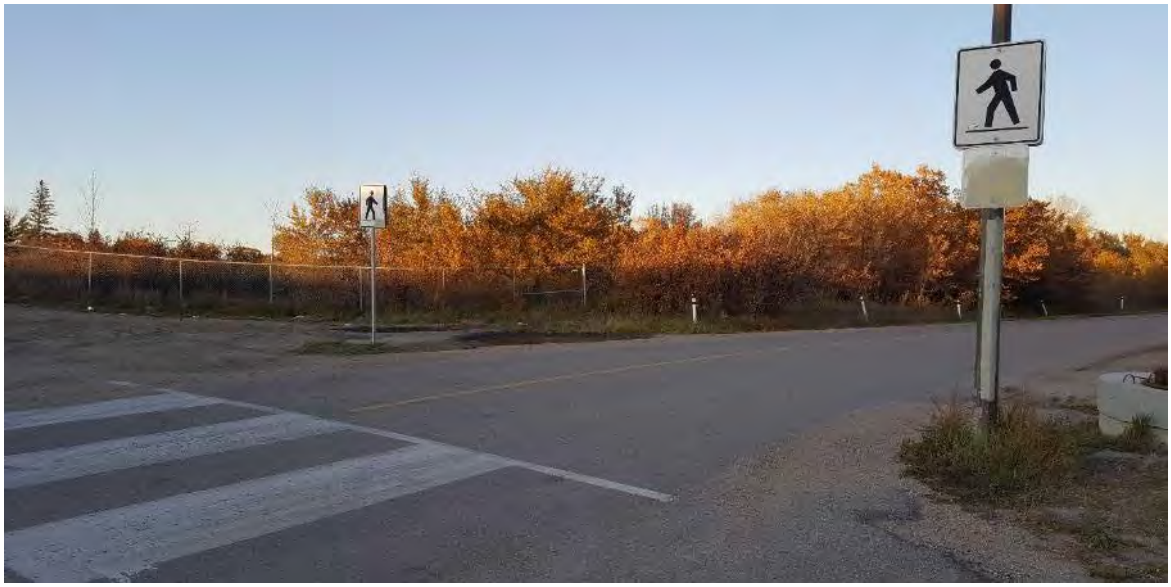


Figure 7-31
Graffiti at Spadina Crescent Crossing

Figure 7-32
Bridge during Day

Figure 7-33
Stairs to Bridge

7.1.8 Circle Drive E & Idylwyld Dr N

This overpass connects two commercial / industrial areas in north Saskatoon. An alternative pedestrian overpass is provided on Northridge Drive though this alternate facility currently has a number of accessibility issues. There are six channelized right turns in this study area.

Observations

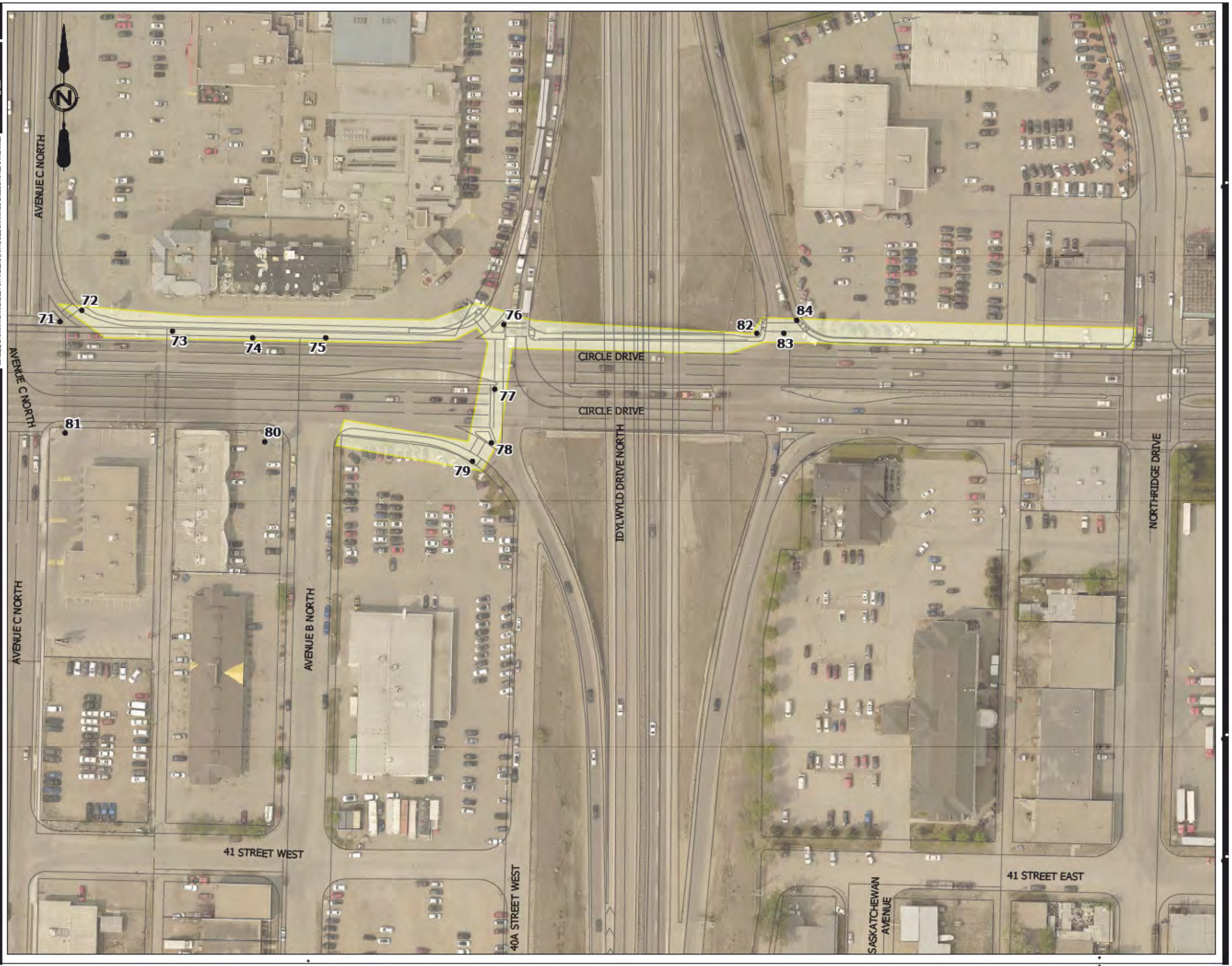
- Three lanes of travel in each direction makes cycling on the road daunting. Any cycling in the area is likely to make a connection as continuous cycling on Circle Drive is not permitted.

Recommendations:

71. Install curb ramp and sidewalk on north side of Circle Drive in front of hotel, land purchase may be necessary. See Figure 7-37.
72. Post shared use path signs in both directions of travel.
73. Remove or cap the bolts of decommissioned light pole protruding from the ground as this is a tripping hazard.
74. Slabjack walk where it is sinking behind curb. Stage this with other sidewalk work in the area as slabjacking occasionally fails on cracked walks and requires some concrete work.
75. Move hydrant out of middle of walk when sidewalk repairs are required in the area or underground work warrants replacement.
76/78. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Increase size of island and pedestrian refuge space. Install curb ramps on channelized islands.
77. Remove and pave median blocking crossing north/south to accommodate pedestrian crossing.
79. Install pedestrian crossing signs and align pedestrian push button with crossing direction.
80. Connect curb ramps on south side of Circle Drive with sidewalk, land purchase may be required.
81. Relocate pedestrian push button currently positioned outside of crossing area and blocked by a number of utilities. See Figure 7-38.
82. Increase pedestrian refuge space at east terminal to accommodate cyclist operating envelope.
83. Refresh pavement crossing markings.
84. Work with property owner to maintain vegetation at northeast corner as hedges currently block vehicle sightlines of crossing pedestrians. See Figure 7-35.

Outside of Scope:

- Align pedestrian push buttons at Circle Drive and Avenue C N with direction of crossing.
- Install curb ramps in the channelized islands at the intersection on Circle Drive and Avenue C N. Increase size as needed to provide adequate refuge space. See Figure 7-36.
- Review hotel accesses on Circle Drive west of the overpass and consider driveway consolidation, replace access with vertical curb walk.



Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE E & IDYLWYLD DR N

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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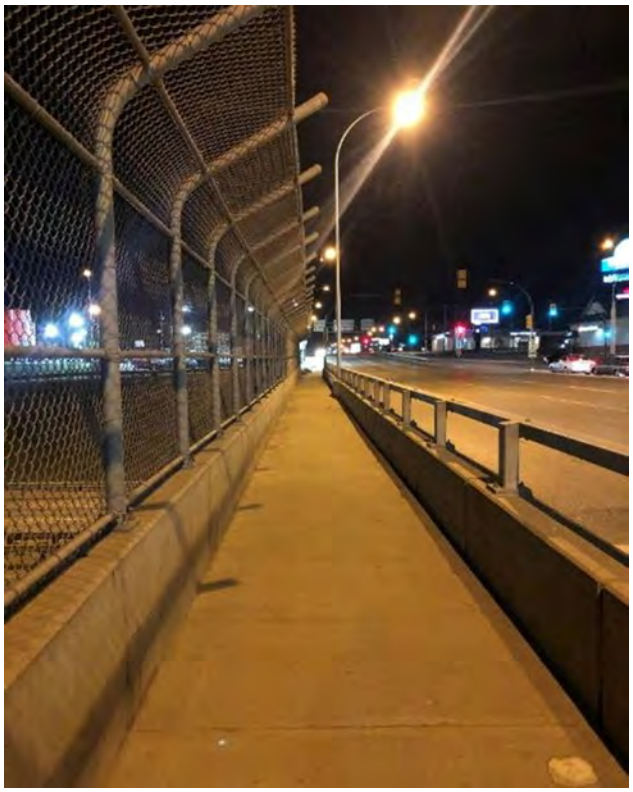

Figure 7-34
Bridge during Night

Figure 7-35
Blocked Sightlines

Figure 7-36
Traffic Island without Curb Ramps

Figure 7-37
Pedestrian Space – Circle Drive North

Figure 7-38
Inaccessible Actuated Recall – Avenue C North

7.1.9 Circle Dr & Warman Rd

This overpass connects residential areas to local commercial areas. Sidewalk is provided on the east of the bridge; regulatory signs are posted on the path for cyclists and pedestrians though shared use path signs appear to be missing. Path ultimately connects to 33rd Street shared use pathway and Meewasin Trail.

Observations

- Light poles are positioned mid path reducing effective path width in half. See Figure 7-39.
- This bridge does not currently have barrier separation between sidewalk and road. The TAC GDG (Chapter 7 Roadside Design) guideline for barriers on an AT path are based on travelled speed and context should be given to vehicle volumes on the adjacent road. Warman Road is posted at 60 km/hr and the AADT for the road is approximately 38,800 vpd. See Figure 7-40.
- Path at south end of study area uses jug-handle to accommodate cyclist operating envelope.

Recommendations:

85. Post shared use sign southbound.
86. Remove and replace sidewalk to north of off-ramp, create a jug handle approach for pedestrians and cyclists, realign crossing to right angle with vehicle wheel path.
87. Determine long term plan for temporary blockade of double right turn lane. See Figure 7-42.

88/95. Refresh crossing pavement marking with enhanced mixed crossride at all crossing locations.

89. Sidewalk repair needed between off-ramp and bridge, approximately 10 m.
90. “Bicycles yield to pedestrians” currently faces northbound travellers but would be more effective if aligned for southbound travellers entering the constrained bridge. Post a second sign for northbound travellers south of the bridge. See Figure 7-43
91. Replace handrail on bridge, bolts have sheared off in one location. See Figure 7-41.
92. Assess ability to upgrade lighting on bridge. Illumination on bridge is dim during evening and it is difficult to see ahead.
93. According to the GDG, barriers are required on a shared use pathway bridge structure where speed exceeds 60 km/hr. A barrier system should be installed between traffic and AT users.
94. Sidewalk repair needed between at bridge transition, approximately 3 m.
96. Realign path and crossing to right angle with travelled way, install curb ramp at south terminal.
97. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Enlarge pedestrian refuge islands.
98. Clear debris from path south of bridge where it has accumulated against the sound wall.

Outside of Scope:

- Install shared use signs in either direction at Rupert Drive.
- Realign and repave path south of study area to create a separated walk. This creates additional separation between AT users and vehicles but also moves path out of conflict with light poles.
- Streetlight pole structural integrity testing on rusted poles

Associated Engineering

BEST MANAGED COMPANIES

City of Saskatoon

LEGEND:

- COMMENTS
- WALK REPAIRS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & WARMAN RD

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-39
Obstructed Path

Figure 7-40
Narrow Path at Overpass

Figure 7-41
Unfastened Handrail

Figure 7-42
Temporary Lane Configuration – Eastbound to Northbound Off Ramp

Figure 7-43
Bicycles Yield to Pedestrian Signs

7.1.10 Circle Dr & 108th St

This overpass connects a residential area to the University of Saskatchewan. As a result, a high number of pedestrians, cyclist, and transit users travel this corridor daily. Two channelized intersections are present within the study area. An alternative route to the Preston Crossing commercial area to the north is provided via Adolph Crescent.

Observations

- Westbound bike lanes begin immediately after bridge allowing cyclists to travel with pedestrians through most constrained road width. Eastbound bike lanes end shortly before the bridge allowing cyclists to climb hill in dedicated space. See Figure 7-45.
- East bound bike lane signs provide adequate warning and direction to cyclists and motorists that bike lanes end and merge into a shared lane road.

Recommendations:

99. Convert 200 meters of monolithic walk to separated walk on west side of bridge, creating additional separation between pedestrians and vehicles.
100/101. Paint additional bike lane designation markings on pavement throughout study area.
102. Consider further geometric analysis to extend eastbound bike lane across bridge and past left turn lane.
103. Refresh crossing pavement marking with enhanced mixed crossride at all locations, apply asymmetrical crossride at westmost channelized crossing as cyclists diverge to dedicated space. Desire lines are illustrated on the map. See Figure 7-44 and 7-45.
104. Install additional lighting at west terminal to provide better visibility of pedestrians to higher speed vehicles exiting Circle Drive.
105. Convert channelized right turn with pedestrian accommodation to high entry angle slip lanes.
106. Increase pedestrian refuge space at west terminal to align with cyclist operating envelope.
107. Post shared use path signs westbound for users entering from 108th Street or Lanyon Avenue. Post additional sign “cyclists yield to pedestrians” as bridge is a constrained environment
108. Enlarge pedestrian refuge islands and install curb ramps in east island. See Figure 7-46.
109. Install “turning vehicles yield to bicycles and pedestrians” at channelized right.
110. Install dedicated pedestrian lighting between 108th Street E and Lanyon Avenue.
111. Widen path between 108th Street E and Lanyon Avenue to 3.0 m. See Figure 7-47.
112. Extend sidewalk north to 109th Street E as pedestrians are currently forced to travel on road.

Associated Engineering

City of Saskatoon

LEGEND:
- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 108TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-44
Desire Line for Bike Operating Envelope

Figure 7-45
Transition to Bike Lane

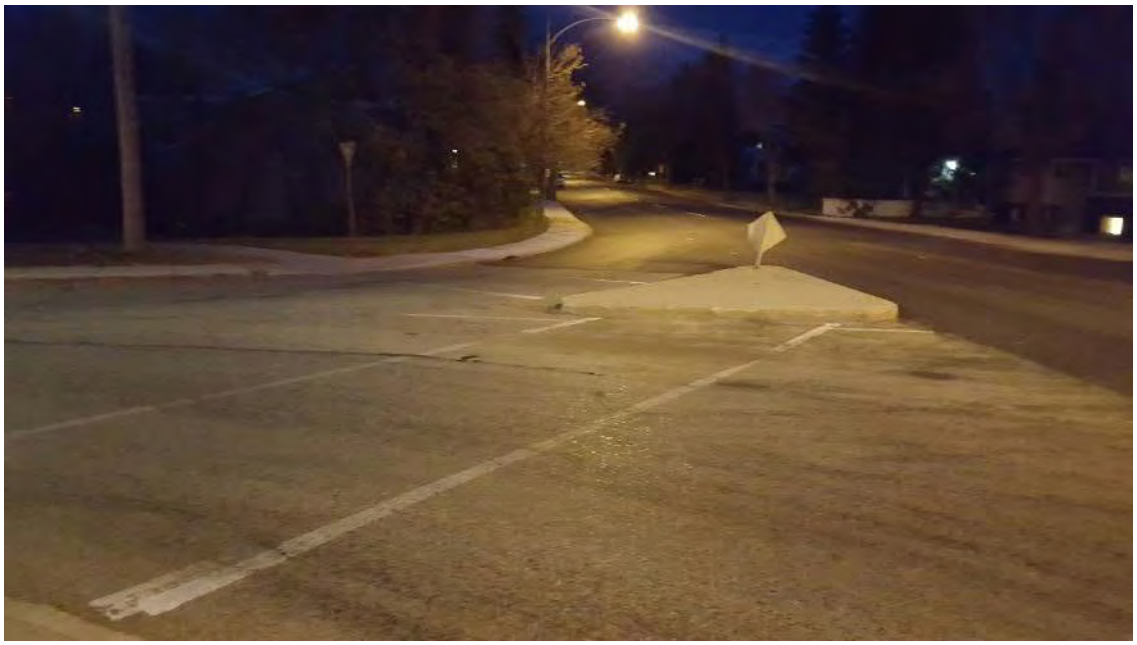


Figure 7-46
Island without Curb Ramps

Figure 7-47
Path to Lanyon Avenue

Figure 7-48
Bridge during Day

7.1.11 Circle Dr & 14th St

This intersection connects residential communities to the University of Saskatchewan and light commercial areas. A painted bike lane is provided for eastbound travel and a shared use path is available for westbound travel.

Observations

- Bike lane paint lines have worn to the point they are nearly illegible.
- Vegetation has encroached on pathway and is reducing usable width.
- Cracking is beginning on asphalt paths. See Figure 7-52.

Recommendations:

113/123. Refresh crossing pavement markings with enhanced mixed crossride on north side of 14th Street E.

114. Realign curb ramp at west terminal to facilitate crossing. This may result in some underground work relocating a catch basin outside of radius. See Figure 7-51.

115. Repaint bike lane pavement markings.

116/128. Clear sidewalk of debris from back alley. This is a trip hazard and may pose operational concerns for people using assistive mobility devices. See Figure 7-50.

117/119. Maintain and remove vegetation encroaching on pathway.

118. Replace fencing under bridge with a permanent solution. See Figure 7-49 and 7-53.

120. Remove graffiti from under bridge.

121. Replace burnt out lights under bridge.

122/125. Widen sidewalk at east terminal to accommodate cyclist operating envelope.

124. Enlarge east island to realign crossing.

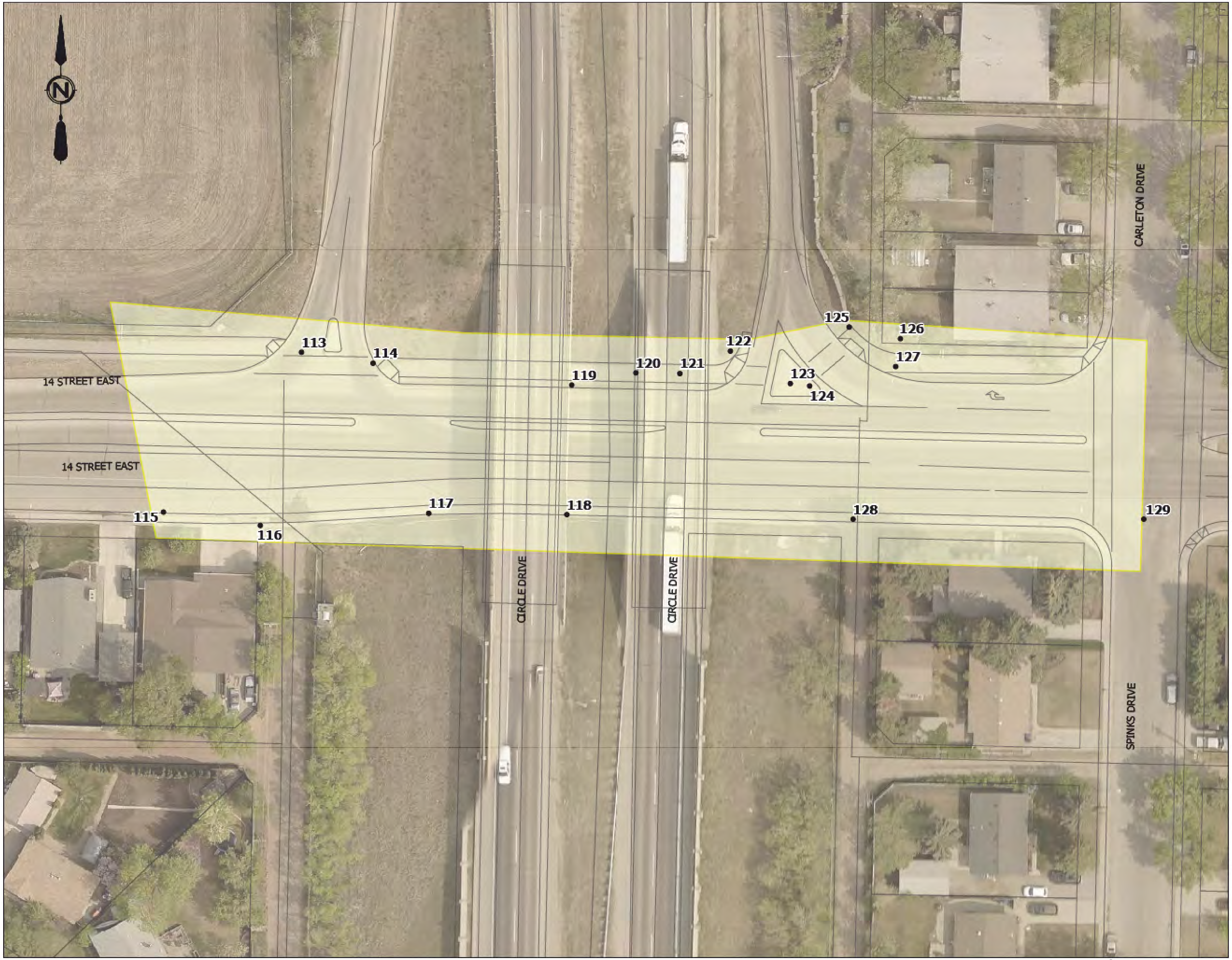
126. Eastbound shared use path sign is blocked by tree, move to back of lane designation sign.

127. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Consider a raised crosswalk where vehicles are entering a residential zone.

129. Refresh crossing pavement markings with enhanced asymmetrical crossride on south side of 14th Street E.

Outside of Scope:

- Install dedicated pedestrian lighting on path west of the bridge to Cumberland Ave, current lighting is directed towards street.
- Consider enhanced elephants' feet with green paint to increase visibility at directional bike access between path and bike lane to west of project area.
- Consider landscaping separated walk; vegetation is struggling to survive large amounts of debris accumulation.



Associated Engineering

BEST MANAGED COMPANIES

Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 14TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-49
Fencing under Bridge

Figure 7-50
Construction Debris on Sidewalk

Figure 7-51
Misaligned Curb Ramp

Figure 7-52
Cracking Beginning on Path

Figure 7-53
Missing Fence on North Sidewalk

7.1.12 Circle Dr and 8th St

This intersection connects residential and commercial areas along 8th Street E to one another. 8th Street E has an AADT of roughly 28,000 vpd, classifying it as an arterial roadway with three lanes of travel in either direction. There are four channelized intersections in this study area.

Observations

- Number of accesses between Arlington Avenue and Circle Drive contribute to high number of pedestrian and cyclist collisions along corridor. There are seven private accesses between Arlington and Circle Drive.
- The sidewalk along the length of 8th Street is not wide enough to support prolonged cyclist and pedestrian shared space. See Figure 7-56.
- Sidewalks are showing signs of wear including trip hazards, asphalt capping on walk, and vegetation growing through walk. See Figure 7-55.

Recommendations:

130. Consider high pedestrian volume directional curb ramps at Arlington Avenue and 8th Street in order to accommodate mobility devices on the wide curb radius.
131. Install pedestrian pushbutton signs at Arlington Avenue and 8th Street.
132. Reduce median islands to eliminate the extension into crosswalks.
133. Install dedicated pedestrian lighting on north sidewalk as street lighting does not illuminate path well.
134. This is a location with a high number of collisions. Access consolidation is recommended along 8th Street and can be applied outside of this project boundary. The TAC GDG Section 8.3.3 states that accesses to arterial roadway should be discouraged and joint use of existing accesses should be considered. Section 6.4.8 reiterates the importance of reducing the number of crossing locations as a means of protecting pedestrians
135/136. Remove monolithic sidewalk and replace with separated walk on north side of 8th Street to provide separation between pedestrians and vehicles.
142. Barriers are recommended under the Circle Drive bridges to separate pedestrians from vehicles. This is not warranted under TAC standards which base warrants on vehicle speed but would improve sense of safety.
148. Work with private property owners to realign access to Centre Mall with centre line of southeast curb ramp.
150. Install driveway aprons at all paved crossing locations to maintain sidewalk and control vehicle speeds. See Figure 7-55 and 7-56.
150. Maintenance is required on sidewalk; walk will require replacement in medium term horizon.
151. Install curb ramps at traffic island at the signalized entrance to Centre Mall.
152/153. Install curb ramps to accommodate north/south movement to Centre Mall.

Improvements at ramp terminals:

137/138/143/145. Increase walk width to accommodate a cyclist operating envelope and address desire lines. See Figure 7-54.
139/140/144/147. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Increase size of island and pedestrian refuge space. Realign all pedestrian recall buttons with direction of crossing in channelized islands

139/146. Install curb ramps to City of Saskatoon standard and side mounted pedestrian crossing signs at west and east ramp terminals.

141/149. Median extends into crosswalk, replace with mountable pedestrian refuge area.

Outside of Scope:

- 8th Street E is identified at a multi-modal corridor in the Active Transportation Report. A variety of permanent and protected cyclist infrastructure should be installed along the corridor to meet this vision. The configuration of a long-term solution will require further investigation outside of this study.
- Consider landscaping separated walk; vegetation is struggling to survive large amounts of debris accumulation.

Associated Engineering

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 8TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-54
Desire line to for Bike Operating Envelope

Figure 7-55
Private Access Crossing Treatment

Figure 7-56
Private Accesses on 8th Street

7.1.13 Circle Dr & Taylor St

This interchange connects two residential areas and commercial amenities over Circle Drive. Saskatoon Fire Station #6 has direct access to Taylor Street on the east side of the bridge. There are four channelized right turns in this study area.

Observations

- Steep grades approaching bridge and four channelized right turns make structure unsuitable for most cyclists riding on road. Access should be provided to sidewalk for cyclists.
- A high number of cyclists and pedestrian collisions were reported along this site, most of which occur at the intersection of Taylor Street and Arlington Avenue. All collision data is prior to intersection geometry changes in summer 2018. See Figure 7-62.
- Sidewalk on north side of Taylor Street between Circle Drive and Acadia Drive is starting to deteriorate. See Figure 7-58.
- Pedestrian push button at midblock crossing to Acadia Drive is located perpendicular to direction of crossing and installed close to the centre line of the pedestrian refuge area, standard location is in direction of crossing and on the side of the pole closest to the pedestrian refuge area.

Recommendations:

154. Install a curb ramp on the northeast corner of Taylor Street and Arlington Avenue.
155. Remove graffiti from light post near northeast corner of Taylor Street and Arlington Avenue. See Figure 7-57.
156. Post shared use signs on Taylor Street east of Arlington Avenue.
157/158/162/163. Install curb ramps, pedestrian crossing signs, and enhanced mixed crossride, realign pedestrian push buttons with direction of crossing at all interchange terminals. See Figure 7-59 and 7-60.
159. Pedestrian signage on northwest terminal has lost reflectivity and is difficult to see clearly at night, replace.
160. Widen all sidewalks leading up the bridge where shared use signs are posted. When major rehab is identified for bridge, include a wider sidewalk that meets shared use path standards.
161. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes when traffic is entering a neighborhood. Consider the application of raised crosswalks as traffic calming for traffic entering residential areas. Increase the size of pedestrian refuge areas.
164. Install lighting where shared use path to south intersects with sidewalk at southeast terminal.
165. Install AT guide sign at southeast terminal with shared use path intersection.
166. Remove accumulated debris from transit stop between Circle Drive and Acadia Drive.
167. Sidewalk on north side of Taylor Street will require repair; consider pairing this with walk widening.
168. Relocate and install pedestrian recall signs on east and west side on pole but maintain button centrally.

Outside of Scope:

- Additional collision analysis should be conducted to determine the effects of recent changes in intersection geometry on cyclist and pedestrian safety.

Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- SIDEWALK RECOMMENDATIONS
- STUDY LOCATION

CIRCLE DRIVE & TAYLOR STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-57
Vandalism on Pedestrian Recall

Figure 7-58
Walk Deterioration

Figure 7-59
Misaligned Pedestrian Recall (looking west, north/south recall)

Figure 7-60
Curb Ramps do not meet Standards

Figure 7-61
Bridge during Day

Figure 7-62
Free Northbound Right Turn – Arlington Avenue

7.1.14 Circle Dr & Preston Ave

This intersection connects residential communities to local amenities including groceries and medical services. There are three channelized right turns in this study area.

Observations

- The grade of the bridge approaches is maneuverable for confident and strong cyclists but may be intimidating for those less experienced. Shared use signs should be posted on the east pathway to provide a safe space for timid cyclists.
- Barrier tapers protecting pedestrians from errant vehicles extend midway though curb ramps, negating purpose of curb ramps. Persons using assistive mobility devices are negatively impacted by this extended taper by reducing actual and apparent access width. See Figure 7-67.
- The wide sidewalk on the northwest terminal is a good example of accommodation for the cyclist operating envelope at turns. See Figure 7-64.

Recommendations:

169/170. Install curb ramps on Dumont Crescent. See Figure 7-63.

171. Post shared use signs southbound for users entering from north.

172. Install bike ramps north of Willis Crescent and south of Arlington Avenue to allow northbound road cyclists the opportunity to maneuver between the shared use path and road. Southbound cyclists would be expected to use the pedestrian crossing at Dumont Crescent and Willis Crescent in order to navigate between road and path.

173/184. Install side mount pedestrian crossing signs at right turn channelization.

174/177. Extra fasteners required at pedestrian pushbutton signs to secure sign to pole at both north terminals. See Figure 7-65.

175/178/183. Refresh all pavement crossing markings with enhanced mixed crossride.

175/178/183. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Consider the application of raised crosswalks as traffic calming for traffic entering residential areas.

176. Install “bicycles yield at high speed ramp” sign southbound.

179/182. Shorten barrier taper by one meter on either side of bridge deck.

180. Post shared use signs southbound after intersection.

181. Remove graffiti from bridge.

185. Install dedicated pathway lighting at south interchange terminal as street lights do not effectively illuminate this area where traffic is beginning to accelerate onto Circle Drive.

186. Post shared use sign northbound for users entering from south.

Outside of Scope:

- Concrete barriers and side mounted signs show signs of vehicle impact. Recently installed speed display for northbound traffic is effective but are designed on a temporary rotation, additional traffic calming measures should be considered.

Associated Engineering

BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- ● COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & PRESTON AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-63
Missing Curb Ramps – Dumont Crescent

Figure 7-64
Wide Sidewalk on North Approach

Figure 7-65
Unfastened Sign

Figure 7-66
Bridge during Day

Figure 7-67
Barrier Encroaches on Curb Ramp

7.1.15 Circle Dr & Clarence Ave

This intersection connects residential communities to local amenities including groceries and medical services. Pathway on the east side of the bridge is currently posted as a shared use path. There are three channelized right turns in this study area.

Observations

- Asphalt shims at bridge transitions show signs of shifting and settling and maintenance has been provided. See Figure 7-68.
- Barrier tapers protecting AT users from errant vehicles extend midway though curb ramps, negating purpose of curb ramps. Persons using assistive mobility devices are impacted by this extended taper. See Figure 7-70.

Recommendations:

187/188/191. Replace faded shared use signs north of the bridge with new shared use signs. Relocate northmost sign closer to intersection to be visible to users entering the path network. See Figure 7-69.

189/193/199. Shorten barrier taper by one meter on either side of bridge deck.

190/193/197. Refresh pavement crossing markings with enhanced mixed crossride through all intersections on east side.

190/194/200. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. Consider the application of raised crosswalks as traffic calming for traffic entering residential areas.

192. Remove graffiti from bridge.

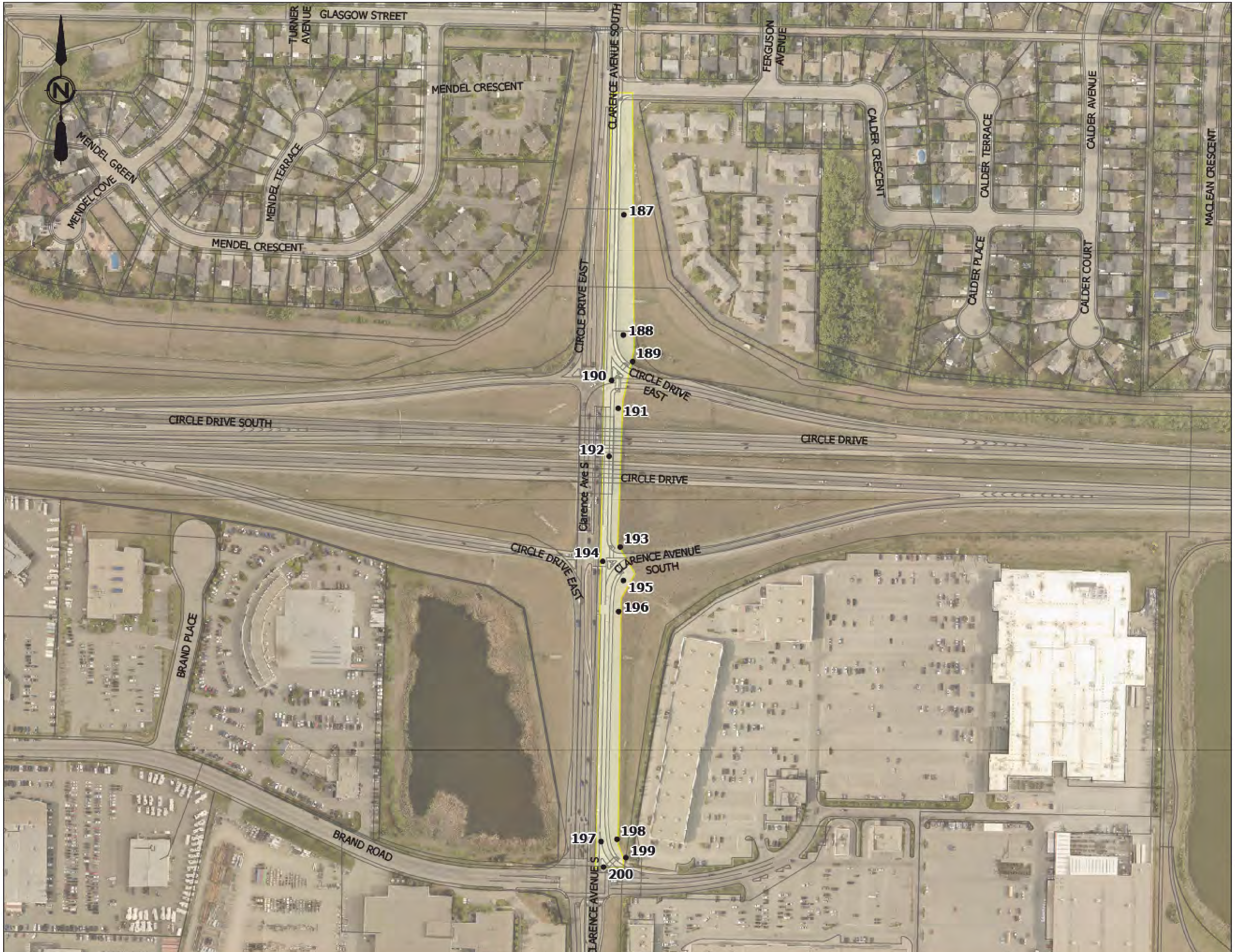
195. Replace damaged yield sign.

196/198. Replace faded signs south of the bridge with new shared use and “bicycles yield at highway speed ramp” signs.

197. Install bike ramps north of Brand Road and south of Calder Crescent to allow northbound road cyclists the opportunity to navigate between the shared use path and road. South bound cyclists would be expected to use the pedestrian crossing at Glasgow Street and Brand Road to navigate between road and path.

Outside of Scope:

- Concrete barriers and side mounted signs show signs of vehicle impact. Speed display for northbound traffic is effective but is installed on a temporary basis. See Figure 7-72. The speed display has since been removed at this location, additional traffic calming measures should be considered.



LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & CLARENCE AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
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Figure 7-68
Asphalt Shim as Bridge Transition

Figure 7-69
Faded Shared Use Sign

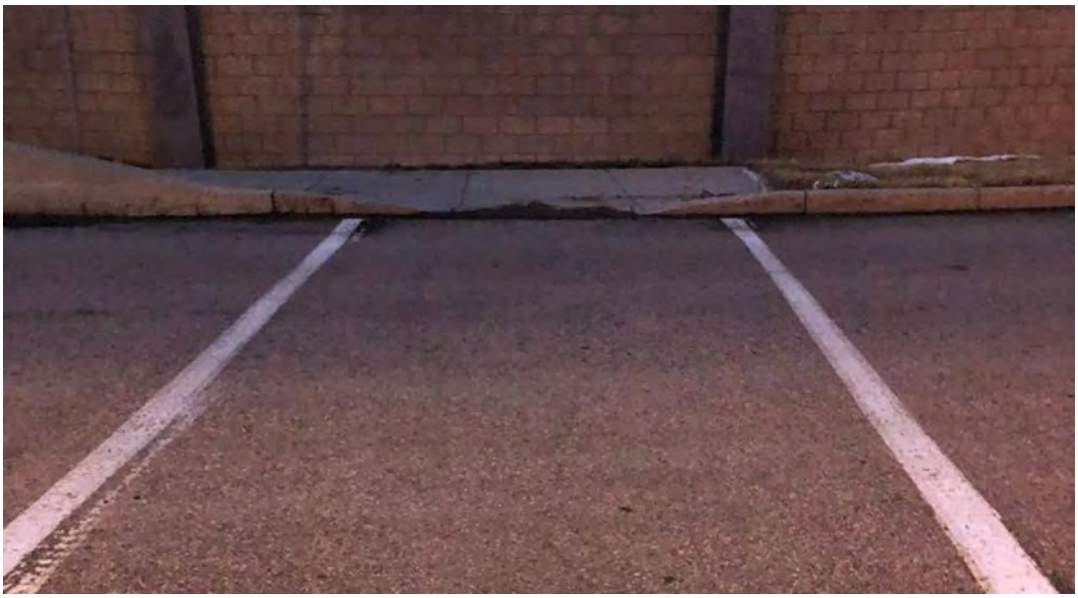

Figure 7-70
Barrier Encroaches on Curb Ramp

Figure 7-71
RRFB Actuated Crossing at Glasgow Street

Figure 7-72
Speed Display Northbound on Clarence Ave

7.1.16 Circle Dr & Lorne Ave

This intersection connects industrial and acreage properties on the south limits of Saskatoon to facilities including Prairieland Park and the Western Development Museum. A multiuse pathway on the west side of the facility connects to the Meewasin Trail and painted bike lanes are provided in both directions on Lorne Avenue. There are three channelized right turns within the study area.

Observations

- Bike lanes end suddenly in both directions without sufficient warning or alternative pathways. See Figure 7-73.
- There is no safe way for cyclists to transition between shared use path and road cycling. See Figure 7-75.
- The pedestrian pathway narrows significantly over the bridge structure. Dedicated space is provided for cyclist on the road separate from path, no immediate action is required to widen path. See Figure 7-73.

Recommendations:

201/205/212. Install RB-37 “turning vehicles yield to bicycles” signs all right turn locations.

202. Install AT guide signs and shared use path signs for those entering the path from the south.

203/204/208/210. Refresh pavement crossing markings with asymmetrical crossride at shared use path crossings southbound and enhanced elephants’ feet at bike only crossings northbound. See Figure 7-74.

204/210. Convert all channelized right turns with pedestrian accommodation to high entry angle slip lanes. Increase size of north refuge island

206. Post shared use sign southbound south of Circle Drive on-ramp.

207. Refresh bike lane pavement markings.

209. Remove graffiti from posts and barriers. Post shared use signs northbound after Circle Drive off-ramp.

211. Install pedestrian recall sign to accompany button on southwest terminal.

213. Remove metal post protruding from path as this is a tripping hazard.

214. Realign pedestrian recall button in line with crossing at southeast terminal, install pedestrian recall sign.

215. Post shared use signs southbound south of Circle Drive off-ramp.

Outside of Scope:

- Install additional bike lanes and adequate transitions to alternative paths or destinations. Install additional signs on Lorne Avenue similar to 108th Street as an interim solution – Bike Lane Ends, Bicycles Merging, Share the Road.

Associated Engineering

BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & LORNE AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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AE PROJECT No.	20194316-00
SCALE	NTS
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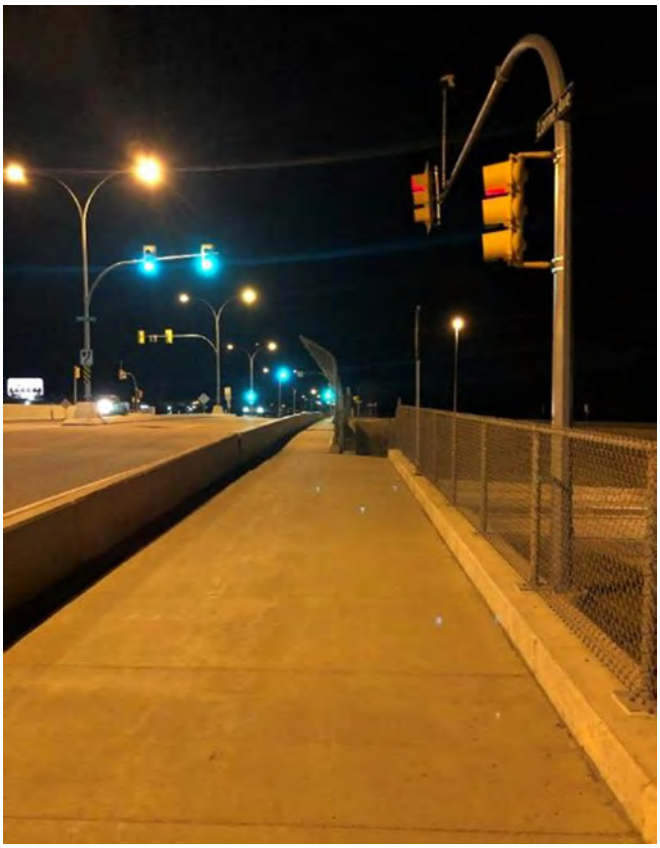


Figure 7-73
Path Narrows at Bridge

Figure 7-74
Asymmetrical Crossride Worn Off

Figure 7-75
Example – Jug Handle in Path to accommodate Cyclist Operating Envelope

7.1.17 Circle Dr & 11th St

This intersection connects a multiuse pathway and residential areas to commercial services to the east. The Meewasin Trail can be accessed via Dudley Street to the south. There is one channelized right turn in this study area.

Observations

- The north side of 11th Street W has limited private accesses and is ideal for a shared use path. This route may connect to a proposed all ages and abilities AT facility on Dudley Street based on a related project proposed by the City. See Figure 7-77.
- This pedestrian route crosses three rail lines, the westmost appears to be abandoned, the central crossing has channelized fencing forcing pedestrians to slow on approach, and the east-most is fully protected by a gate. AT users circumvent the current channelized fencing by travelling into roadway shoulder. See Figure 7-80.

Recommendations:

216. Review applicability of high entry slip ramps at a skew intersection. Consider alternative treatment including a raised crosswalk and "turning vehicles yield to bicycles and pedestrians".

217. Install AT guide signs and shared use path signs at diverge.

218/221/222. Install pedestrian push-button signs to accompany push buttons in the channelized pedestrian refuge space, northeast corner of Dundonald Avenue, and the southwest corner of Dundonald Avenue. See Figure 7-76 and 7-79.

219. Remove and replace central AT rail crossing control with one that meets Transport Canada standards and guidelines, fenced channelized control or dedicated AT arm and gate system.

220. Refresh pavement crossing markings with enhanced mixed crossride for east/west movements.

223. Install additional lighting at south sidewalk on 11th Street W between crossing and residential area.

224. Consider consolidating private accesses on 11th Street across from Dawes Avenue to reduce conflict zones for pedestrians/cyclists and vehicles accessing private property.

225. Post shared use path signs for users entering from Dawes Avenue.

226. Consider enhanced intersection treatment at 11th Street W and Dawes Avenue in anticipation of connection to all ages and abilities corridor to south. Options include protected intersection and dedicated bike signals.

227. Refresh pavement crossing markings with enhanced mixed crossride for north/south movement at Dawes Avenue.

228. Install shared use path sign for users entering pathway from north.

Outside of Scope:

- Update rail crossing treatment on shared use pathway north of study area. Cyclists circumvent the crossing control, negating its purpose.

Associated Engineering

CANADA'S BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- ● COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 11TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

PAGE 16 OF 39

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

PLOT DATE: 7/7/2020 3:02 PM
SAVE DATE: 7/7/2020 3:02 PM SAVED BY:

Figure 7-76
Pedestrian Recall without Signs

Figure 7-77
Private Access on 11th Street

Figure 7-78
Shared Use Path to North

Figure 7-79
North Channelized Island

Figure 7-80
Channelized Rail Crossing

7.1.18 Circle Dr & 22nd St

This intersection connects the 22nd Street pedestrian overpass and residential communities to the Confederation shopping centre and Blairmore Bikeway. Shared use signs are posted in both directions of travel, allowing cyclists to use the sidewalk on the north side of 22nd Street W.

Observations

- The asphalt path to the east of the bridge connecting the pedestrian overpass is in poor condition. See Figure 7-82.
- A barrier and wide walk are provided for pedestrians and cyclists on the north side of 22nd Street W. See Figure 7-85.
- There is a well-worn pedestrian desire line on the south side of 22nd Street where no AT facilities or safe crossing opportunities have been provided.

Recommendations:

229/230/232. Shared use signs at Blairmore Bikeway are faded but legible, replace in next five years.

231. Install AT guide sign at west path diverge.

233. Remove graffiti from sign.

234. Widen path on northwest side of 22nd Street W and Confederation Drive to accommodate operating envelope for cyclists and increase pedestrian refuge area.

235. Refresh pavement crossing markings at 22nd Street W and Confederation Drive with enhanced mixed crossride.

236/242. Shared use signs on 22nd Street Ware faded but legible, replace in next five years. See Figure 7-84.

237. Pedestrian recall sign is broken at southwest corner of 22nd Street W and Confederation Drive. Remove and replace. Install side mount pedestrian crossing signs for motorists. See Figure 7-81.

238. Convert channelized right turns with pedestrian accommodation to high entry angle slip lanes. See Figure 7-83.

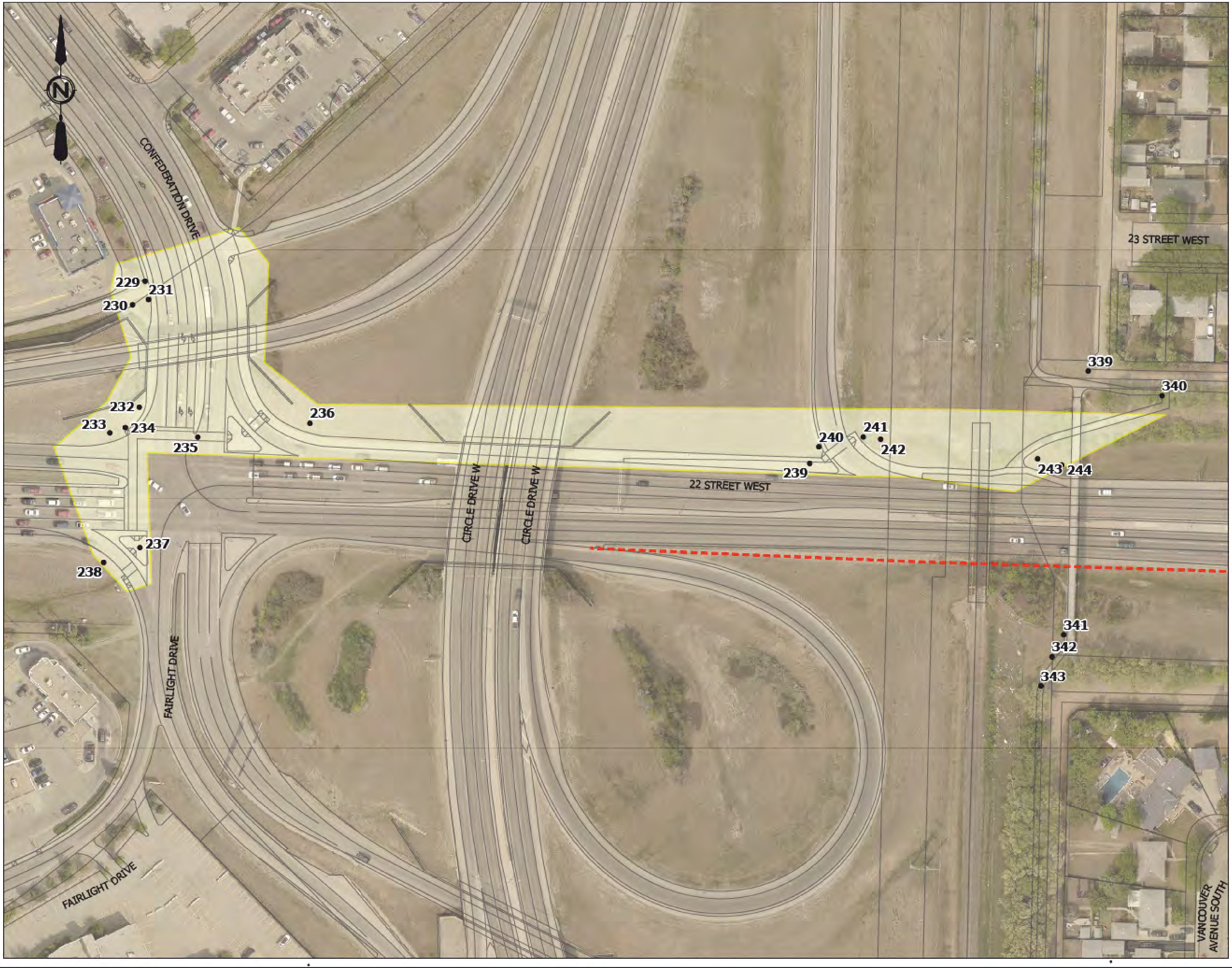
239. Remove old side mount sign base protruding from walk as this is currently a trip hazard.

240. Widen path at on-ramp crossing to accommodate operating envelope for cyclists.

241. Refresh pavement crossing marking at on-ramp with enhanced mixed crossride.

243. Install AT guide sign at east path diverge.

244. Asphalt path requires some maintenance.



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BEST MANAGED COMPANIES Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 22ND STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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REV	X
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Figure 7-81
Broken Pedestrian Recall Sign

Figure 7-82
Path Beginning to Deteriorate

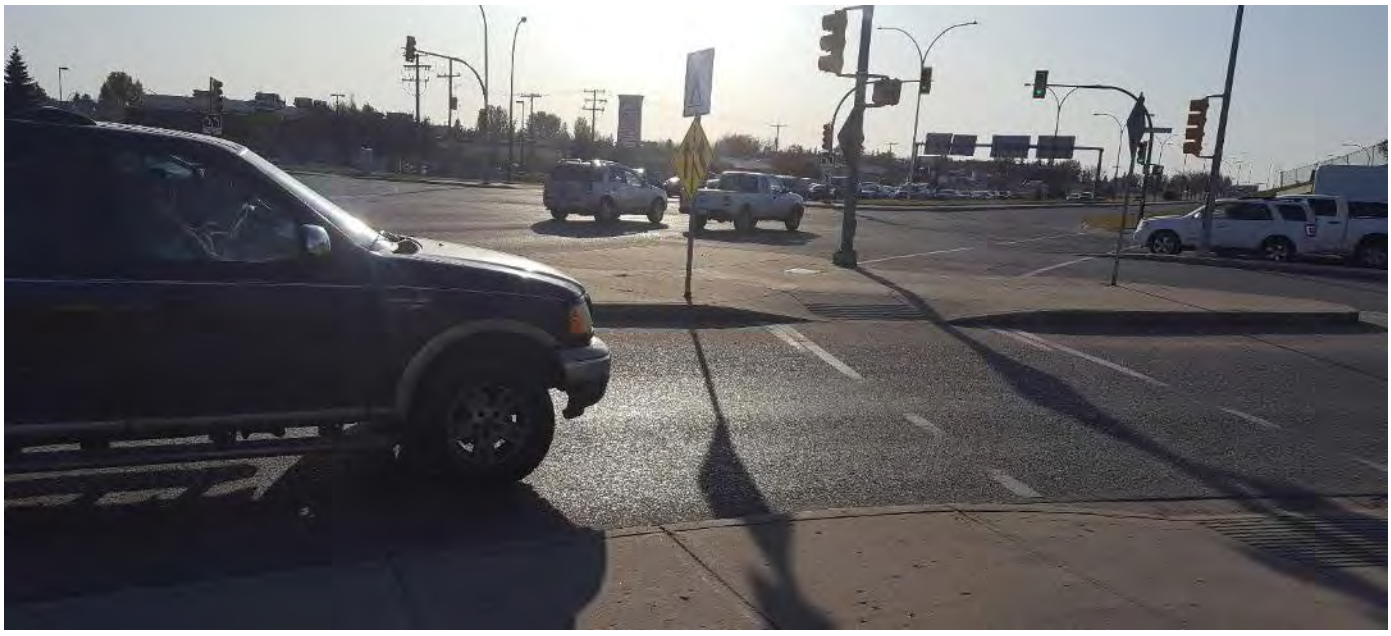


Figure 7-83
Channelized Island at Confederation Drive

Figure 7-84
Shared Use Sign Beginning to Fade

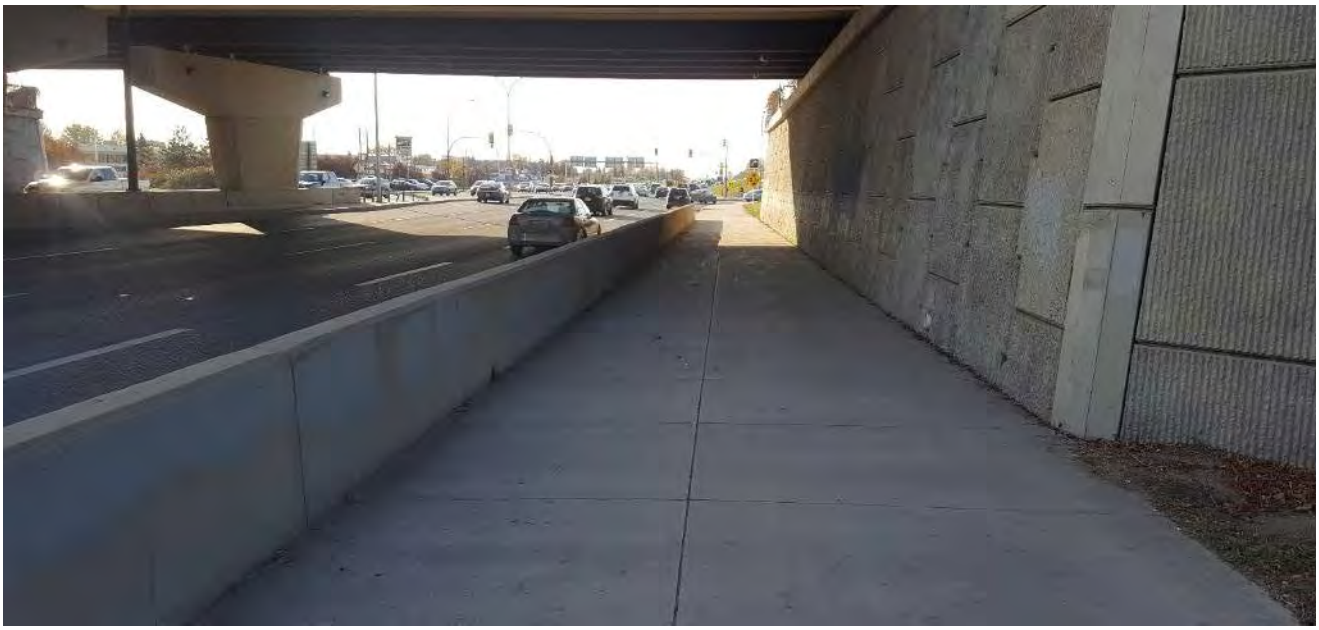


Figure 7-85
Wide Shared Use Path under Bridge

7.1.19 Circle Dr & 33rd St

This intersection connects two residential areas to recreational areas under the Circle Drive W and 33rd Street W overpass. Sidewalks are present on both sides of 33rd Street W. A rail line intersects 33rd Street W at a skew angle east of the interchange.

Observations

- This location felt safe to bike in traffic as a confident cyclist, but more timid users may be more comfortable on the sidewalk due to the volume of traffic on 33rd Street W accessing and exiting Circle Drive.
- The 33rd Street W and Avenue W N double southbound left signal timing overlaps with north/south pedestrian crossing. These overlapping movements likely result in many conflicts. Additional analysis is required to confirm this hypothesis. Three near misses were noted by auditors between vehicular and pedestrian traffic.
- 33rd Street W has an AADT of roughly 19,000, correlating to an arterial classification. At this volume, pedestrians would be more comfortable when separation from vehicular traffic is provided.
- Temporary road geometry blocking a second left turn lane at southbound exit ramp creates a physical barrier for persons using assistive mobility devices.

Recommendations:

245. Consider reviewing and retiming the signal at 33rd Street W and Avenue W N to allow a 4 second lead for pedestrians crossing northbound, allowing them to cross a greater portion of the left turn conflict zone.

246. Realign southeast pedestrian recall button with crossing direction. Install a larger pedestrian refuge area. Post shared use signs east of Avenue W N and west of Edmonton Avenue as an interim measure until a multimodal corridor is developed in line with the Active Transportation Plan (Appendix B).

247. Remove graffiti visible from north sidewalk between Avenue W N and Circle Drive exit ramp southbound.

248. Construct permanent island or create a designated crossing point between barriers at temporary island.

249. Move light poles out of sidewalk path or reinstall sidewalk as a separated walk. See Figure 7-89.

252/253/255. Consider replacing monolithic walk with separated walk between freeway ramps. See Figure 7-86.

256. Reduce skew in sidewalk at northeast ramp approaching crossing.

258. Install curb ramps

260/261. Realign sidewalk on north and south side of 33rd Street W to cross rail line at right angle. See Figure 7-87 and 7-88.

262/263. Realign pedestrian recall buttons on north side of intersection between 33rd Street W and Edmonton Avenue. Install curb ramps and increase pedestrian refuge space.

264. Increase pedestrian refuge area on southwest side of intersection between 33rd Street W and Edmonton Avenue so pedestrian recall button is accessible to all users.

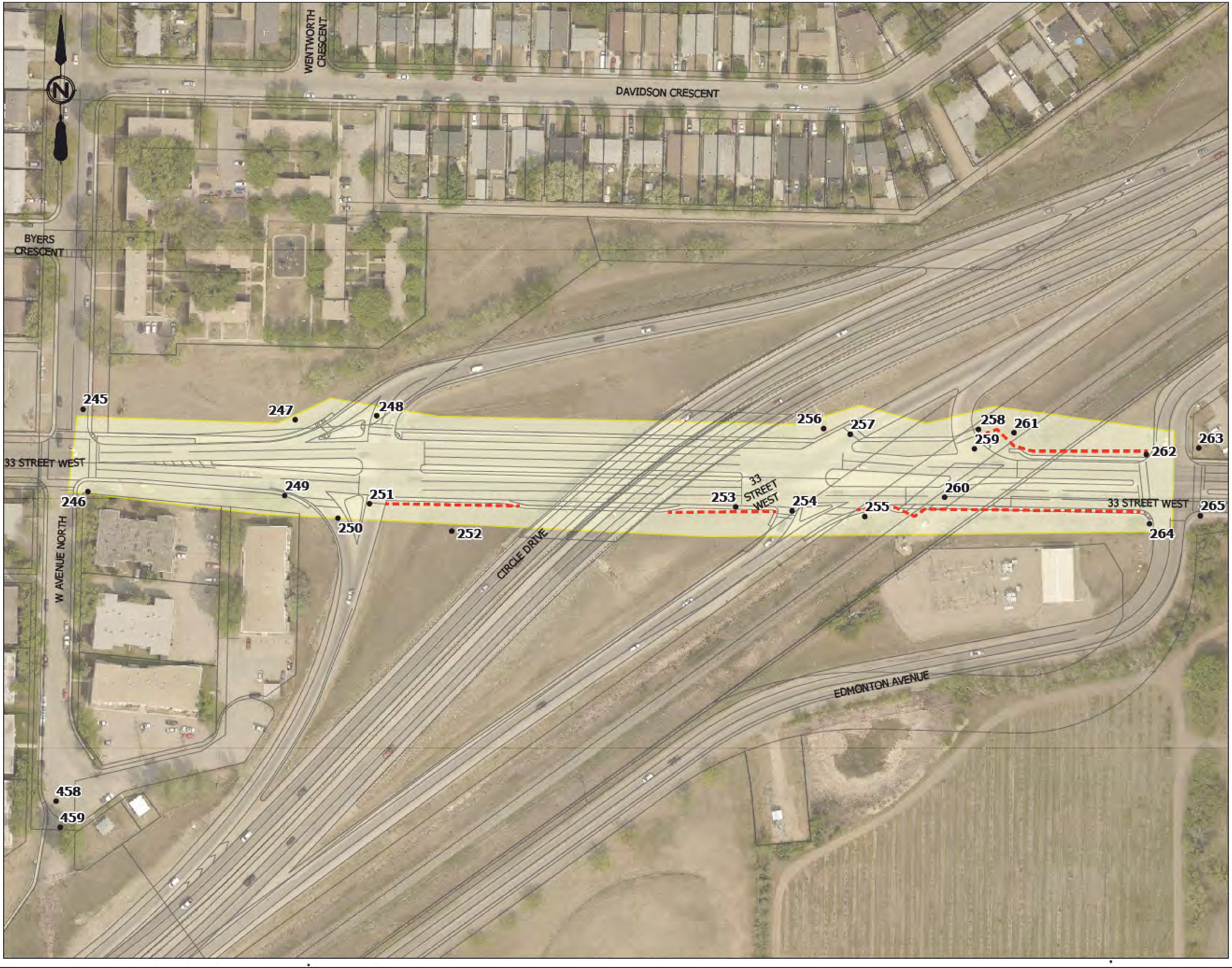
265. Install curb ramp on southeast side of 33rd Street W and Edmonton Avenue and align pedestrian recall button with direction of crossing.

Address pedestrian safety concerns at channelized right turn locations:

250. Short term – extend sidewalk south at southwest ramp and repaint pedestrian crossing at right angle with travelled way. Refresh all pavement crossing markings at Circle Drive ramps.

251/254/257/259. Long term - remove channelized right turns and replace with high entry angle slip ramps. Install dedicated pedestrian lighting at intersections to increase visibility.

Figure 7-86
Crossing at Southeast Channelized Intersection



LEGEND:
- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 33RD STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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REV	X
DESCRIPTION	ISSUED FOR REPORT

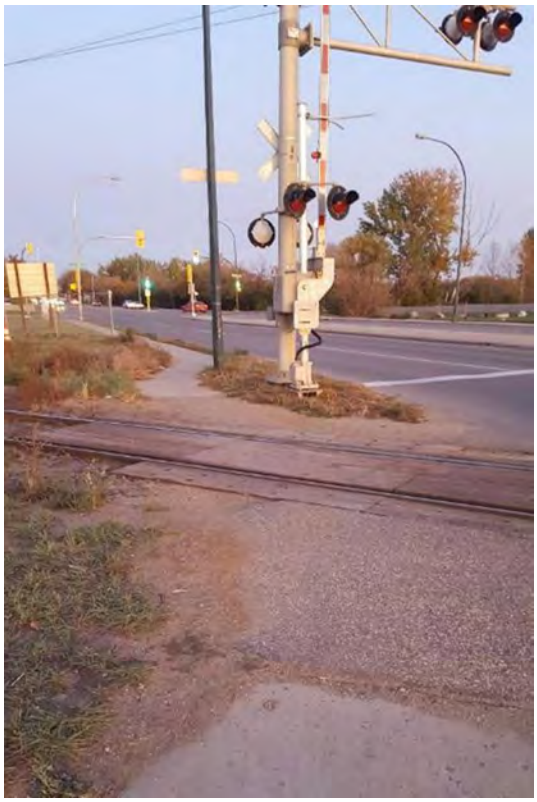


Figure 7-87
North Rail Crossing

Figure 7-88
South Rail Crossing

Figure 7-89
Utilities in Walk on South Side

7.1.20 Idylwyld Dr & Lorne Ave/Ruth St

This intersection connects residential communities to the Prairieland Park event centre under Idylwyld Drive. Sidewalks are provided on both sides of the road and there are no channelized right turns in the study area. This area supports a high peak volume of pedestrians during special events at Prairieland Park.

Observations

- Light poles are placed in the centre of the north sidewalk further narrowing the existing walk available to pedestrians. See Figure 7-92.
- This location felt safe to bike in traffic as a confident cyclist, but more timid users may be more comfortable on the sidewalk due to the volume of traffic on Ruth Street and Lorne Avenue accessing Idylwyld Drive. See Figure 7-93.
- The sidewalk on the north side of Ruth Street splits for 50 m, with a separated sidewalk that ends suddenly at a back alley and a continuous monolithic walk. See Figure 7-94.

Recommendations:

266. Refresh crossing pavement markings at St George Avenue with zebra markings.
267. Paint north/south crossings at curb ramps on Ruth Street at St George Avenue, install side mount pedestrian crossing signs.
268. Relocate utility box in centre of south walk outside pathway.
269. Remove portion of divergent sidewalk on north side of Ruth Street. In the long term, replace the monolithic walk with continuous separated walk.

270/276. Relocate light poles in centre of north walk outside of narrow pathway.

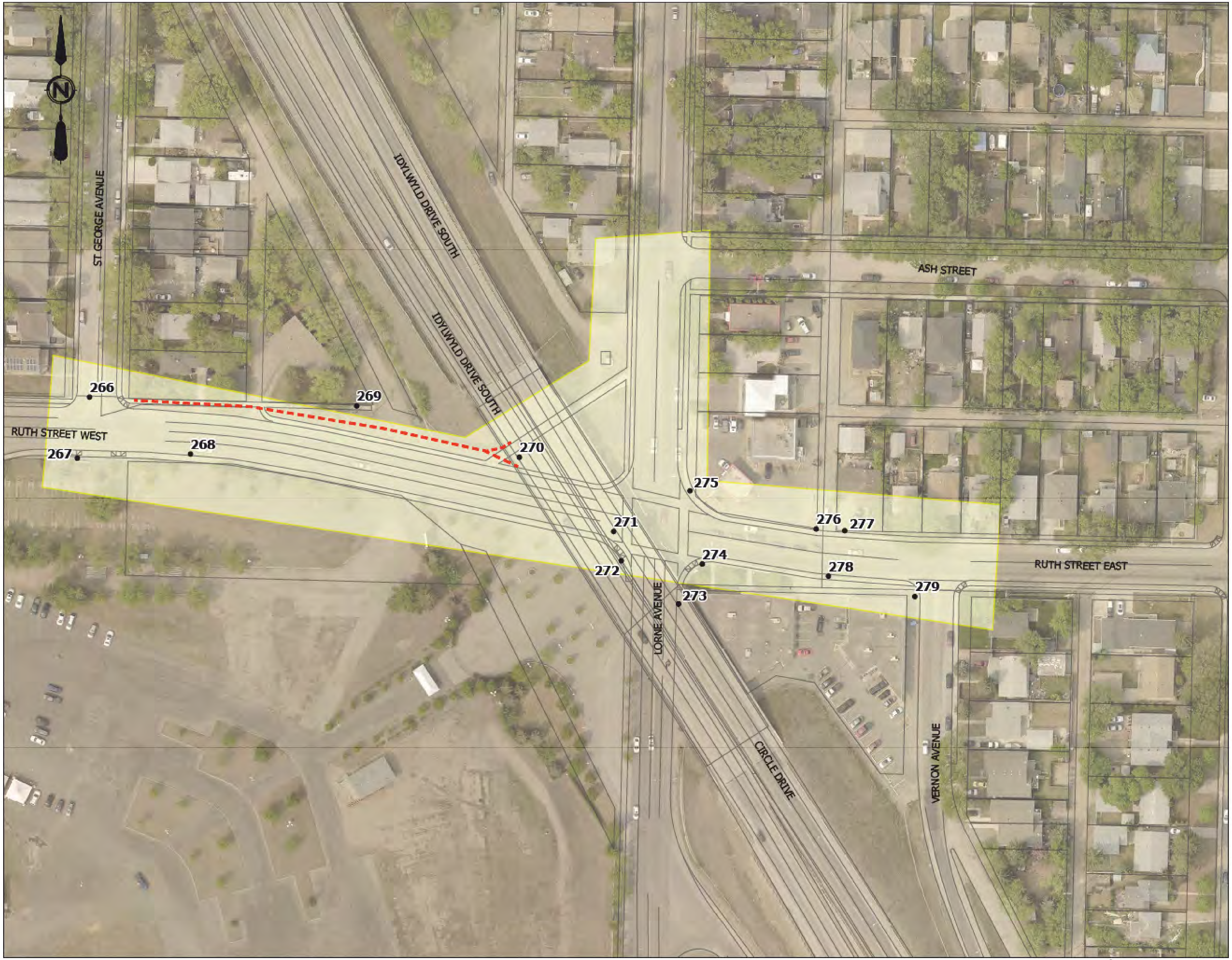
271. Replace burnt out light under bridge.

272/275. Install high volume pedestrian ramps at Lorne Avenue and Ruth Street according to City of Saskatoon standard drawings. Refresh crossing pavement markings.

273. Two lights under the Idylwyld Drive overpass have been replaced with brighter bulbs. Recommend replacing the remaining eight lights for consistent illumination under bridge.
274. Pedestrian recall buttons are misaligned but not to the point of misdirection or confusion. Consider realigning on a low priority basis. See Figure 7-90.
277. Portions of walk on the north side of Ruth Street between Lorne Avenue and Vernon Avenue require removal and replacement due to deterioration. See Figure 7-91.
278. Remove and replace private access with standard crossing access on a low priority basis.
279. Install curb ramps at Ruth Street and Vernon Avenue, refresh pavement crossing markings.

Outside of Scope:

- Freeway guide sign northbound on Lorne Avenue has been damaged and requires replacement.



Associated Engineering

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

IDYLWYLD DRIVE & LORNE AVENUE/ RUTH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-90
New Pedestrian Recall Buttons

Figure 7-91
Walk Deterioration

Figure 7-92
Missing Structure and Utility in Walk at Diverge

Figure 7-93
Intersection of Lorne Avenue and Ruth Street

Figure 7-94
Duplicated Walk Ends in Back Alley

7.1.21 Idylwyld Dr & Taylor St

This intersection connects two residential communities across the Idylwyld Drive and Taylor Street interchange. Taylor Street connects to an on-street cycling route on Saskatchewan Crescent leading to the Meewasin Trail.

Observations

- Sidewalk has deteriorated badly at alley accesses where trucks are travelling over walk and access. See Figure 7-97.
- Sidewalk is only provided on one side of Taylor Street, forcing pedestrian on the north side to cross to continue their travels. See Figure 7-98.
- This location felt safe to bike in traffic as a confident cyclist, but more timid users may be more comfortable on the sidewalk due to the volume of traffic on Taylor Street.

Recommendations:

280. Clean graffiti from bike route paths southbound. See Figure 7-95.

281. Consider a bike ramp to transition southbound right cyclists to Taylor Street westbound.

282. Post “share the road” signs to accompany bike route signs westbound on Taylor Street.

283. Refresh crossing pavement markings at the intersection of Taylor Street and Saskatchewan Crescent. See Figure 7-96.

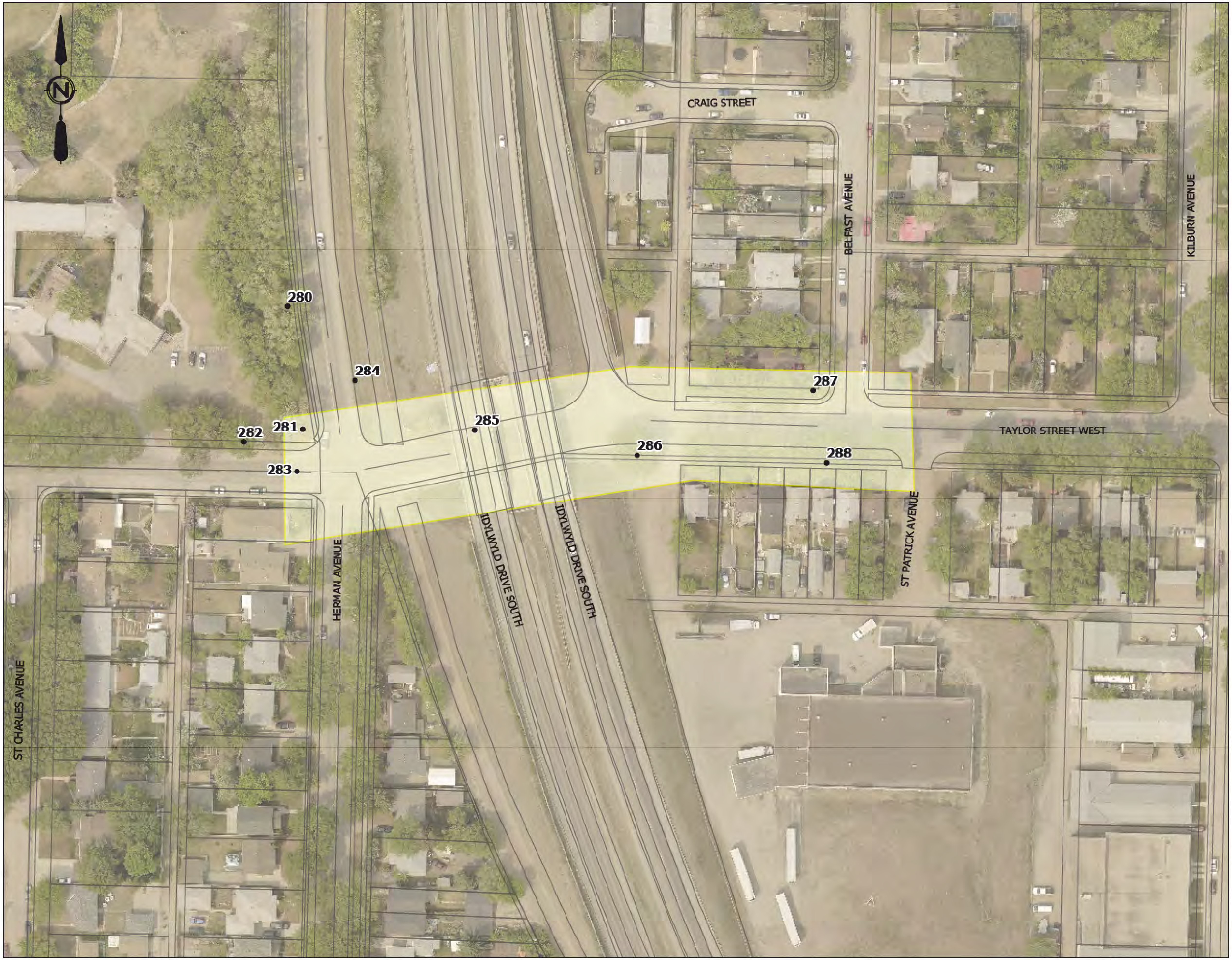
284. Post “share the road” signs to accompany bike route signs northbound on Saskatchewan Crescent.

285. Replace all four burnt out lights under westmost bridge.

286. Remove and replace alley crossing, consider wooden bollards or hard landscaping in green space to west of alley to deter eastbound right turning trucks from crossing into the alley on the sidewalk.

287/288. Address forced crossing at Belfast Avenue:

- Option 1 – Install mid-block curb ramps, pavement crossing markings, and pedestrian crossing signs on Taylor Street across from Belfast Avenue. Install “cross other side” sign on the northwest corner of Belfast.
- Option 2 – Extend sidewalk on Taylor Street from Belfast Avenue to Saskatchewan Crescent. Reconstruct throat of Idylwyld Drive on-ramp to reduce crossing distance for pedestrians and control vehicle speeds.



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Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

IDYLWYLD DRIVE & TAYLOR STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-95
Graffiti on Bike Route Sign

Figure 7-96
Crossing to Bus Stop

Figure 7-97
Vehicle Shortcutting at Alley Access

Figure 7-98
Walk Under Bridge

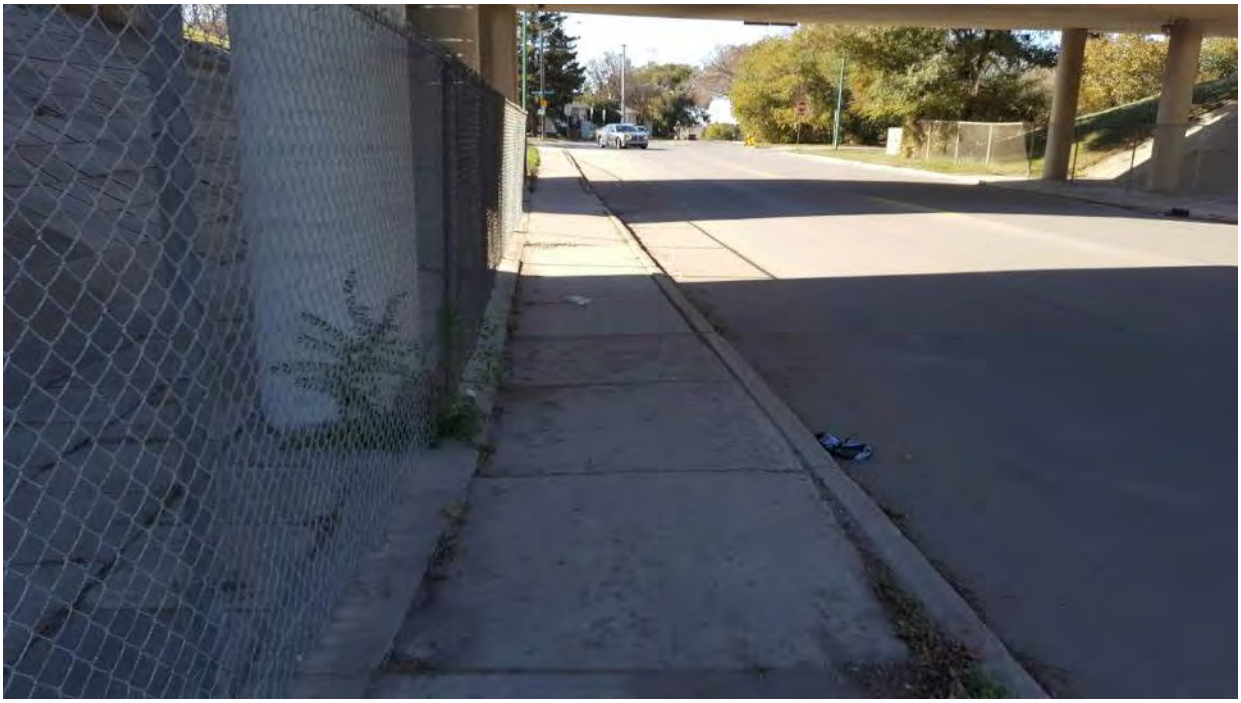


Figure 7-99
Fencing Under Bridge

7.1.22 Idylwyld Dr & 8th St/Lorne Ave

This intersection connects two residential communities to parks and grade schools across the Idylwyld Drive and 8th Street interchange. There are two channelized right turns that pedestrians are required to cross within the study area.

Observations

- Recent curb extension at the intersection of 8th Street E and Poplar Crescent has halved crossing distance and provided a valuable queuing area for pedestrians walking to local parks and amenities.
- Path adjacent to the Idylwyld Drive exit terminates suddenly in a back alley at a set of stairs without warning. See Figure 7-101.
- Auditors noted traffic signals unable to detect cyclist, creating significant delay for northbound traffic.
- Sidewalk is only provided on one side of 8th Street W, forcing pedestrian on the south side to cross in order to continue their travels

Recommendations:

289/290. Install lighting at path terminal in back alley as there is currently no lighting at stairs. Remove and replace stairs and replace with path accessible to cyclists.

291. Widen path adjacent to Idylwyld Drive to 3.0 m.

292. Replace lighting under Idylwyld Drive overpass.

293. Consider connecting path along desire line from Coy Avenue to path at overpass.

294. Install AT guide sign at diverge with notification of trail end in back alley.

300-303. Install curb ramps on Coy Ave crossing and midblock crossing on 8th Street W. Refresh pedestrian crossing pavement markings. See Figure 7-102.

304. Two lights under Idylwyld Drive and 8th Street W overpass have been replaced with brighter bulbs. Recommend replacing the remaining five lights for consistent illumination under bridge.

305. Install zebra crosswalk at 8th Street W and Poplar Crescent for east/west movement. Current north/south crossing does not connect to pedestrian facilities, either decommission or build pathway. See Figure 7-104.

Improvements at the intersection of 8th Street and Lorne Ave:

295. Realign crossing at channelized right turn to cross at a right angle. Consider adding a raised crossing to slow traffic entering residential area. Repaint crossing. Install or recalibrate cyclist detection at signals.

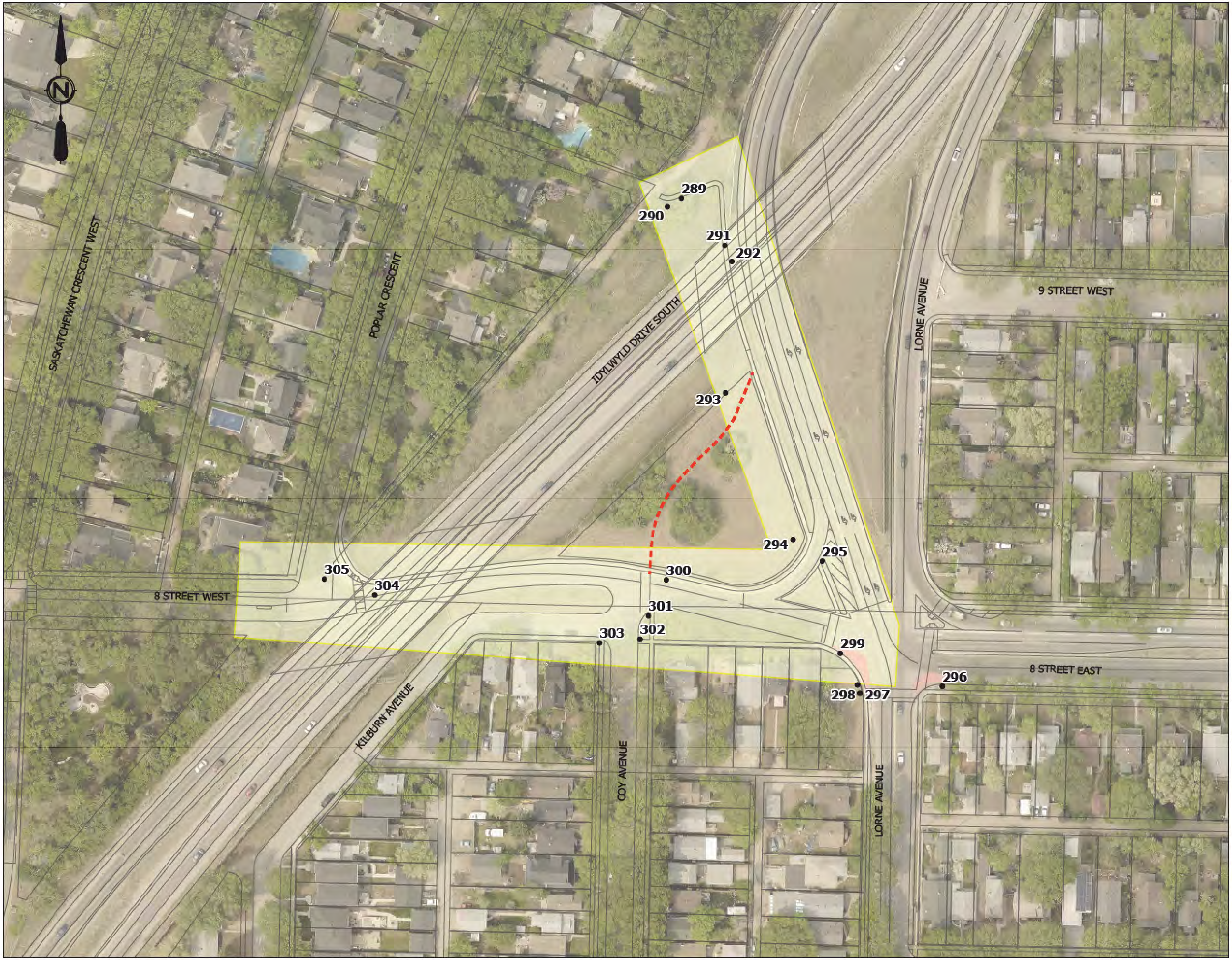
296. Consider a curb extension to the southeast corner to reduce crossing distance as this lane is currently dedicated to parking. Ensure the design vehicle may still navigate the intersection safely.

297/299. Remove and replace sidewalk on southwest corner with severe deterioration, install curb ramps. Consider reducing curb radius to align skew intersection and shorten pedestrian crossing distance. See Figure 7-100.

298. Pedestrian recall button at southwest corner is placed on the south side of the pole but refuge area is to north of pole, button is hidden from pedestrians. Relocate button to the north side of pole. See Figure 7-103.

Outside of Scope:

- Study implications of replacing signals with multilane roundabout to address skew.



Associated Engineering

BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- SIDEWALK RECOMMENDATIONS
- STUDY LOCATION

IDYLWYLD DRIVE & 8TH STREET/ LORNE AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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Figure 7-100
Deterioration on Walk

Figure 7-101
Path Terminal in Alley

Figure 7-102
Intersection Crossing at Coy Avenue

Figure 7-103
Pedestrian Recall Located South of Refuge Area

Figure 7-104
Crossing to Fenced Wall at Poplar Crescent

7.1.23 McKercher Dr & College Dr

This overpass connects residential areas to the Sutherland area across College Drive. Sidewalks are not present on 105th Street at this time though redevelopment in the area will trigger their installation. There is one channelized right turn pedestrians must navigate and three channelized right turns road cyclists may navigate within the study area.

Observations

- Steep grades approaching bridge and three channelized right turns make structure unsuitable for some cyclists riding on road. Access should be provided to sidewalk for cyclists.
- Sidewalk was under construction on the southeast corner of McKercher Drive and Aspen Place. Based on previous work in the area, a traffic signal will eventually be installed at this location. See Figure 7-107.
- Sidewalk is only provided on one side of McKercher Drive, forcing pedestrians on the west side to cross in order to continue their travels

Recommendations:

306/307. Post shared use signs for users entering site from north and south.

308. Increase physical separation between path and road at north transition. Consider moving to a more urban cross section and construct barrier curb. Consider bike ramp at bridge for northbound cyclists.

309. Long term – widen AT path when bridge is identified for major rehab work. See Figure 7-109.

310/311. Repaint crossing markings with enhanced mixed crossride.

312. Address high pedestrian conflict area at south east channelized right. See Figure 7-105 and 7-106.

- Short term – install “turning vehicles yield to bicycles and pedestrians” and enhanced mixed crossride.
- Long term – convert channelized right to a high entry slip lane.

313. Relocate light poles and utility boxes. Current position cuts usable walk space in half. Alternatively realign walk as a separated facility. See Figure 7-108.

314. Realign pedestrian recall buttons at the intersection of McKercher Drive and Boychuk Drive parallel with crossing direction. Northeast pedestrian recall is offset from pedestrian refuge area by approximately five meters. Widen pedestrian refuge area or relocate pole within reach of pedestrians.

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BEST MANAGED COMPANIES

Platinum member

City of Saskatoon

LEGEND:

- ● COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

MCKERCHER DRIVE & COLLEGE DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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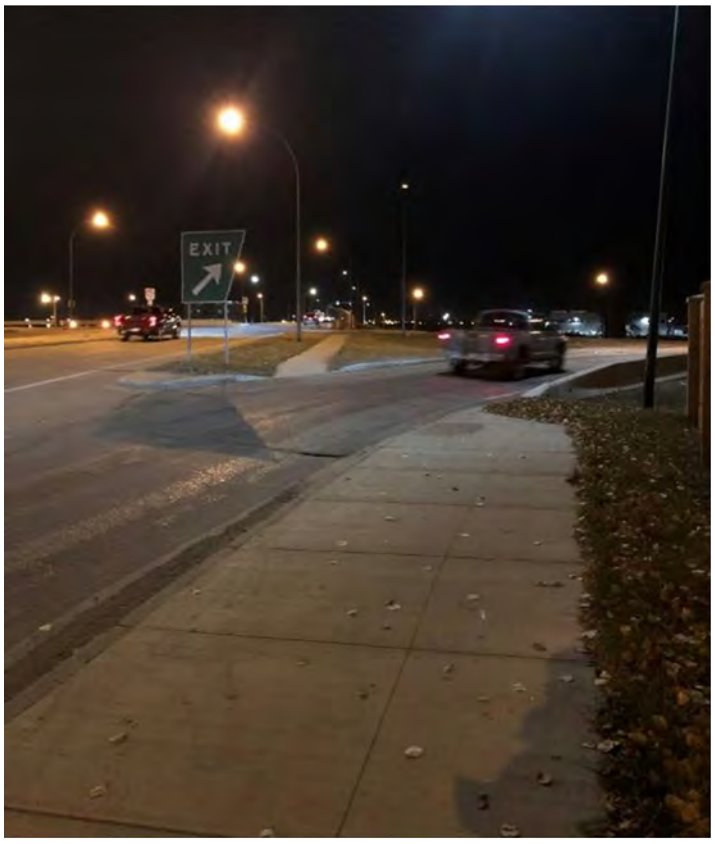


Figure 7-105
Channelized Crossing During Night

Figure 7-106
Channelized Crossing During Day

Figure 7-107
Construction on McKercher Drive and Aspen Place

Figure 7-108
Wide Walk Obstructed by Utilities

Figure 7-109
Bridge During Day

7.1.24 Clarence Ave S – Railway

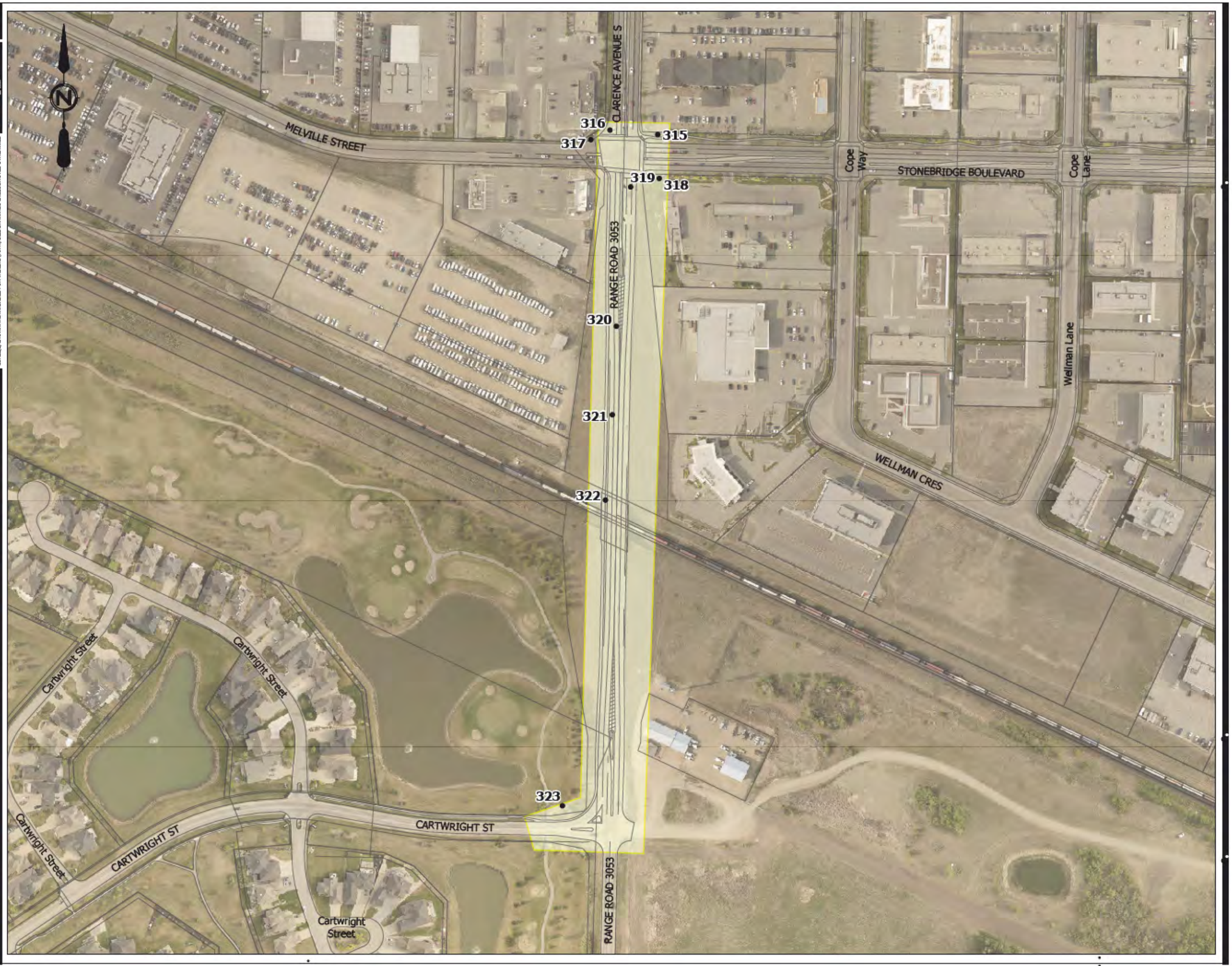
This rail overpass connects a golf course and the Willows neighborhood to the Stonebridge commercial area. This bridge parallels the southmost city limits, as a result there is a low demand for pedestrians and cyclists. Improvements south of the intersection of Clarence Ave and Stonebridge Boulevard may be phased with city growth and changes to land use or mode share.

Observations

- There are numerous operational and safety issues at the intersection of Clarence Ave and Stonebridge Boulevard. These issues should be addressed on a higher priority basis than other recommendations within this site.
- Northeast pedestrian recall is misaligned with intersection and sign is not properly bolted to signal pole. See Figure 7-111.
- Northwest pedestrian recall is located out of reach of refuge area.
- Bridge approaches have sunk significantly at deck transition creating large trip hazards and bumps to vehicles. This hazard is present on both the road and sidewalk surface. See Figure 7-112.
- There is no pedestrian pathway south of Cartwright Street and Clarence Ave and no intersection treatment for cyclists or pedestrians. Treatment should be reviewed when development occurs to south and demand for this movement grows.

Recommendations:

315. Realign pedestrian recall button and fasten sign to pole.
316. Increase size of pedestrian landing or relocate pedestrian recall button to south signal pole.
317. Install a sidewalk on the northwest side of the intersection leading to commercial area to west. This may require the purchase of land or negotiation with private property owners. See Figure 7-114.
318. Install curb ramp on southeast corner and realign pedestrian recall parallel to intersection crossing. See Figure 7-113.
319 Replace burnt-out street light at intersection.
320. Remove graffiti from bridge.
321. Approximate 6% overpass approach grade makes this a difficult climb for cyclists and road is not appropriate for shared traffic and cyclist use for timid or new cyclists. Post shared use signs and install a bike ramp at bridge when cyclist volumes warrant improvement. Consider safety rail on outer edge of sidewalk on bridge approaches. See Figure 7-110.
322. Address sunken bridge approaches on path network by either installing asphalt shim or concrete slicing.
323. Replace channelized right turn lane at Cartwright Street with high entry slip ramp and additional protective crossing measures once development triggers north/south pedestrian movement.



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CANADA'S BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CLARENCE AVENUE S & RAILWAY

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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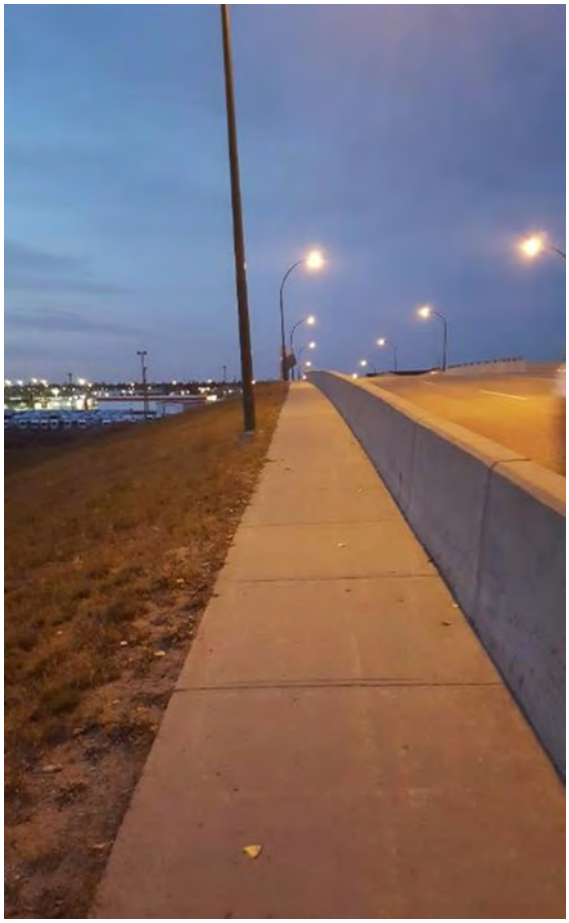

Figure 7-110
Steep Side Slope on Approach

Figure 7-111
Misaligned Pedestrian Recall

Figure 7-112
Trip Hazard at Deck Transition

Figure 7-113
Curb Ramp at Southeast Corner of Stonebridge Boulevard

Figure 7-114
Sidewalk on Northwest Corner of Stonebridge Boulevard

7.1.25 College Dr & Central Ave

This pedestrian overpass structure connects two residential communities over College Drive to local amenities including the Sutherland commercial area and Sutherland industrial area. This structure is only accessed by stairs and forces pedestrians to cross the beginning of a large radius channelized right turn lane.

Observations

- Stairs to pedestrian bridge include bike wheel ramps that switch sides at each entrance, forcing cyclists to switch hold and position. See Figure 7-115.
- Intersection of Central Ave and 103rd Street E is missing sidewalk and curb ramps on the east side. This intersection is unsafe to cross as a pedestrian and cyclist with a high volume of turning traffic and high vehicle speeds. This intersection is the gateway to College Drive and vehicles accelerate through the intersection to merge onto College Drive. See Figure 7-118.
- The recent installation of a transparent sound wall at the south end allows pedestrians and cyclists to assess the facility and see oncoming traffic. Consider implementing this at more locations where applicable.

Recommendations:

324. Install sidewalk and curb ramps on east side of 103rd Street E intersection. Land purchase may be required.
325. Explore alternative geometric reconfiguration and signal retiming at intersection with 103rd Ave including curb extension. Southbound lanes would become a shared left / through/ right and signal timing including protected permissive signals will require analysis. Turning templates will need to be applied for design vehicle to ensure compatibility.
326. Re-align both west pedestrian recall buttons to face parallel to controlled crossing leg.
327. Realign southeast pedestrian recall button to face parallel to controlled crossing leg. Landscaping rock creates an inaccessible landing for cyclists and those using mobility devices.
328. Post shared use sign.
329. Address pedestrian conflict with accelerating southbound vehicles.
- Short term – refresh pavement markings with enhanced mixed crossride at a right angle to travelled way, remove and repair curb ramps, and install a RRFB system, if warranted. Separate and widen sidewalk on channelized island and include a curb and gutter as a physical barrier between pedestrians and motor vehicles. See Figure 7-117 and 7-119.
- Long term - Alternatives include reducing the radius of the southbound right ramp and extending the pedestrian bridge across the remaining space eliminating the conflict point. This alternative includes the removal and replacement of stairs with spiral or switch back ramps but would likely be cost-prohibitive.

330 Install bike wheel ramps on a continuous sides of approach stairs.

331-333. Remove graffiti from structure.

333. Repair broken fence at desire line; investigate destination of desire line and potential connections.
334. Replace burnt out light.
335. Install consistent alley crossing treatment, pedestrian crossing signs in both directions of travel.
336. Sidewalk through back alley is either buried or destroyed; clean or remove and replace.
337. Post shared use signs for users entering from south.
338. Install curb ramp at pedestrian crossing on Carleton Drive.

Associated Engineering

City of Saskatoon

LEGEND:

- COMMENTS
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

COLLEGE DRIVE & CENTRAL AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-115
Bike Wheel Ramp at Stairs

Figure 7-116
Bridge During Day

Figure 7-117
Sidewalk on Channelized Island

Figure 7-118
Crossing on Central Avenue to Bus Stop

Figure 7-119
Crossing at Acceleration Lane to College Drive

7.1.26 22nd St W by Circle Dr

This pedestrian overpass runs parallel to a rail line and connects to two residential communities across 22nd Street W with path links leading to the Blairmore Bikeway and Confederation shopping area. This structure provides a vital link to local communities to commercial and grocery services.

Observations

- The space is generally well cared for but vegetation obscures paths to south and reduces lighting effectiveness.
- Consider community outreach commissioning public murals and assistance maintaining litter buildup.

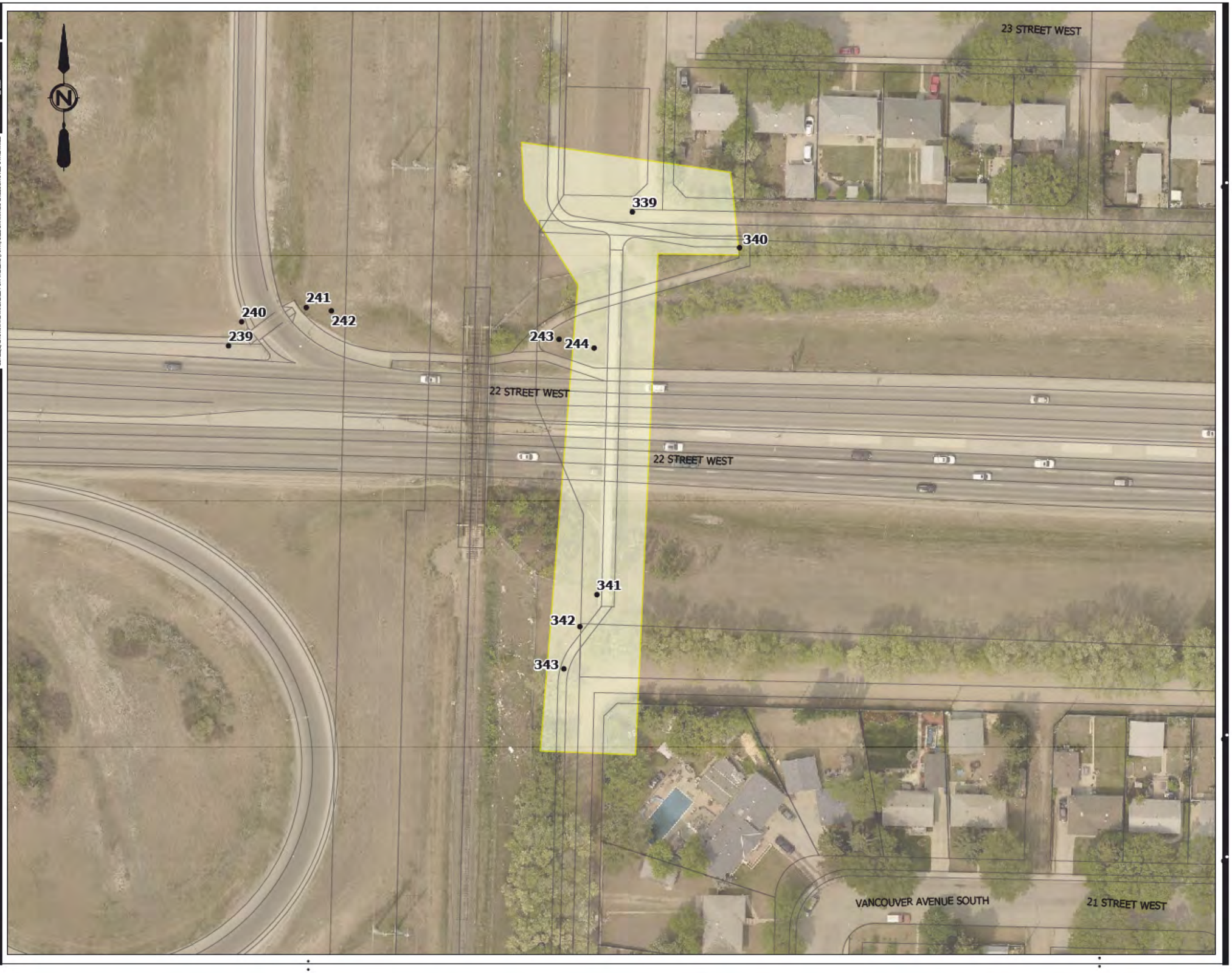
Recommendations:

339. Install shared use sign for those entering the path from the northern alley and AT guide sign with local destinations. See Figure 7-120.
340. Install additional lighting at north switchback.
341. Clean litter from bridge approaches.
342. Install additional lighting at south approach.
343. Remove graffiti from post.

Outside of Scope:

- Desire lines are well worn on south side of 22nd Street W. There is currently no safe crossing through the 22nd Street W and Circle Drive W interchange to this location. Consider a conflict analysis to determine where crossing activity occurs and additional measures to reduce risk taking.

Figure 7-120
North Overpass Terminal – Proposed Guide Sign Location



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LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

22ND STREET W BY CIRCLE DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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7.1.27 22nd St by Shaw Centre

This pedestrian overpass connects the Blairmore Bikeway and residential communities to high schools and the Shaw Centre. This structure supports a substantial volume of grade school children accessing school facilities daily.

Observations

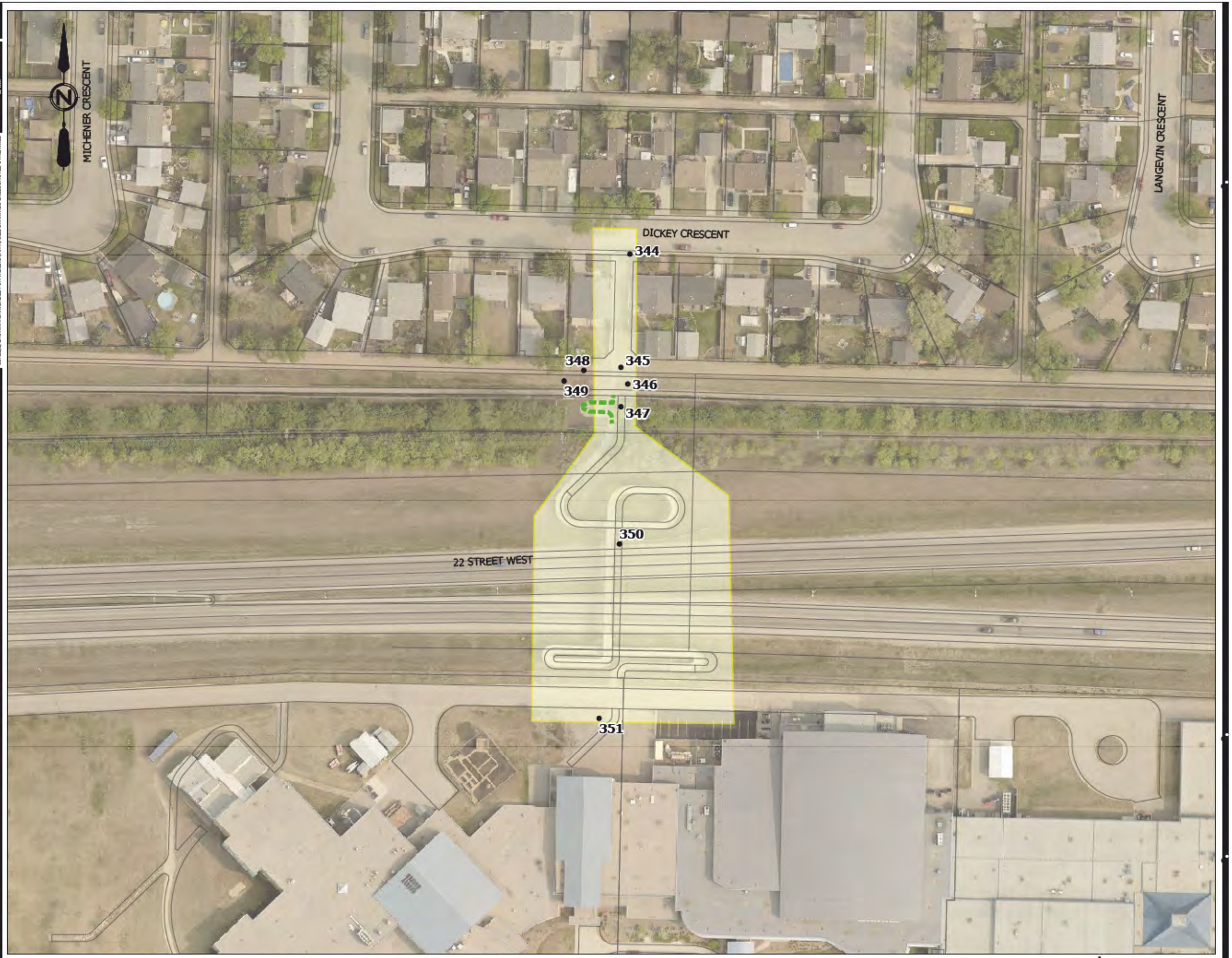
- Vertical grades are low, and the facility is accessible for all ages and abilities. See Figure 7-121.
- The recent installation of a transparent sound wall allows path users to assess the facility as they approach it and see oncoming traffic. Consider implementing this in more locations where applicable. See Figure 7-122.
- Low spot in pavement appears to be holding water at access to Dickey Crescent.

Recommendations:

344. Remove and replace alley crossing with a crossing and curb ramp to address drainage and access issues.
345. Remove lewd graffiti from transparent sound wall.
346. Install AT guide signs, shared use signs southbound, and bike route signs east and westbound directing users to overpass entrance, bikeway, and destinations.
347. Pave increased radius at switch back to match current wheel paths and bike operating envelope.
348. Add an additional light at intersection with Blairmore Bikeway to improve visibility at decision point. This area is heavily vegetated, reducing effectiveness of ambient light.
349. Apply consistent alley crossing treatment, pedestrian crossing signs in back alley in both directions of travel.
350. Remove graffiti from bridge.
351. Install pedestrian crossing signs and combined crossride at alley crossing to school and Shaw Centre. Monitor effectiveness of speed bump on vehicle speeds.

Figure 7-121
Wide Switchback Path

Figure 7-122
Transparent Sound Wall



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LEGEND:

- COMMENTS
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

22ND STREET BY SHAW CENTER

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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7.1.28 Idylwyld Dr by St Patrick Ave/Hilliard St

This pedestrian overpass connects two residential communities across Idylwyld Drive. This structure provides a dedicated AT alternative to the Idylwyld Drive and Ruth Street crossing with access leading to the Meewasin Trail and Prairieland Park, a major events space.

Observations

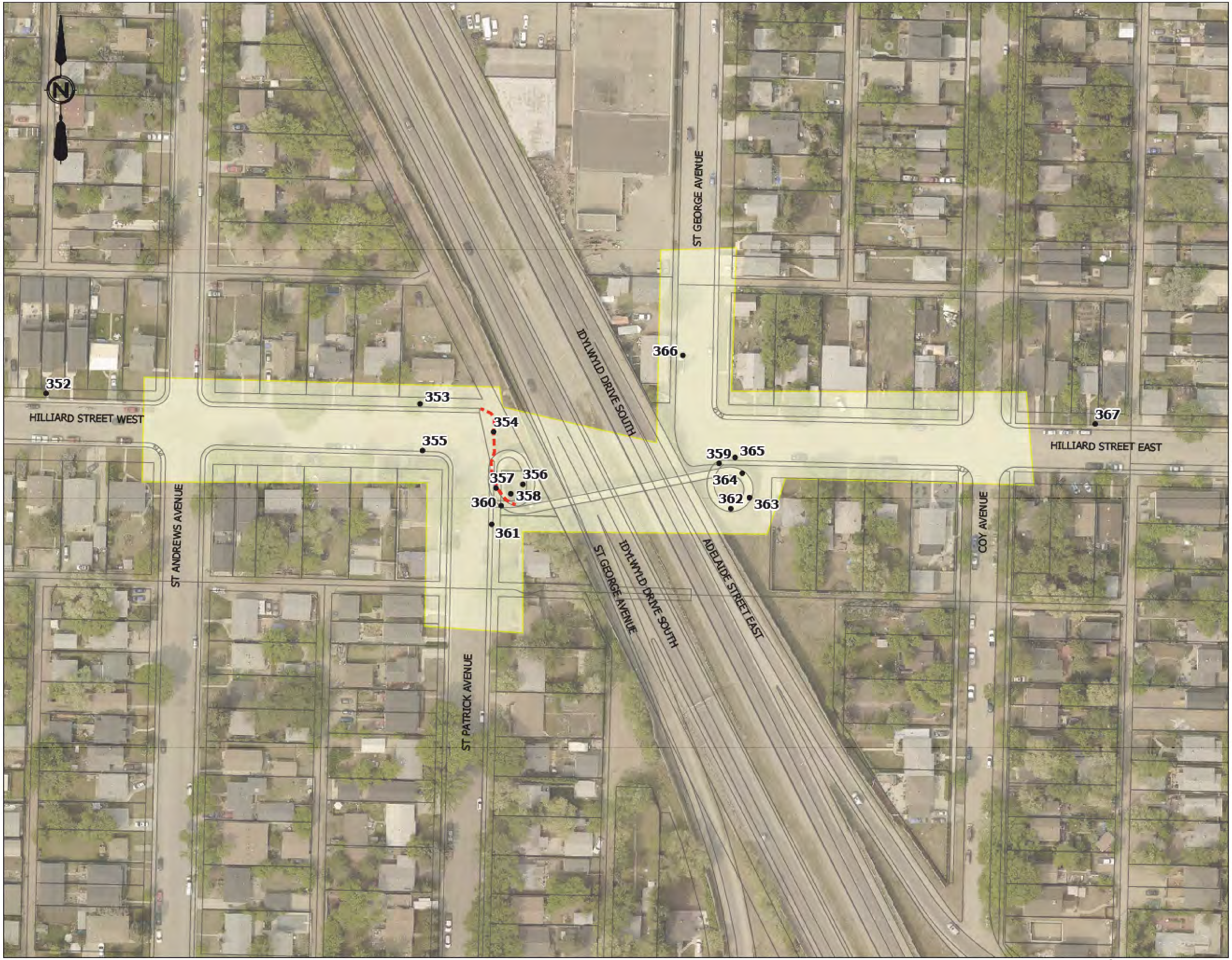
- Structure is visible and well used. Cycling signs are present on Hillard Street W and Hillard Street E though the westbound sign on the west side of the overpass is obscured by vegetation. See Figure 7-123.
- Structure terminates without easily available bike access on both sides of Circle Drive. Cyclists are forced to ride on sidewalk approaching and departing the structure. See Figure 7-125 and 7-127.

Recommendations:

352. Revisit tree maintenance program regarding sign visibility and clear obstructed sign of vegetation.
353. Add a westbound cycling sign visible from the west overpass terminal decision point.
354. Connect sidewalk on east side of Hillard Street W across back alley. Confirm if this back alley provides access to services or utilities. If not, consider decommissioning and servicing primarily from St Andrews Avenue.
355/361. Install a pedestrian warning signs on Hillard Street W and pedestrian crossing sign on St Patrick Ave in advance of the intersection to warn motorists of potential conflict.
356. Remove graffiti from bridge.
357. Realign west pathway to increase directional access to curb ramp and crosswalk. Add crossing pavement markings at this location.
358/359. Install additional railing for pedestrian safety exiting the structure, grade is still steep at these locations.
360/362. Remove bollards from path entry and develop traffic calming policy. See Figure 7-126.
363. Repair chain link fencing on overpass.
364. Install additional lighting on east terminal where bridge overlaps spiral ramp to address structure shadowing.
365. Add crosswalk pavement marking and pedestrian crossing signs on Hillard Street E.
366. Install pedestrian crossing warning signs on St George Ave southbound to provide additional warning to motorists with poor sightlines.
367. Install westbound bike route sign approaching structure on Hillard Street E.

Outside of Scope:

- Coy Avenue is a one-way street whose entrance is blocked by temporary concrete jersey barriers with reflective tape. Consider permanent solutions at one-way exit on Coy Ave northbound including curb extension.



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BEST MANAGED COMPANIES

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LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

IDYLWYLD DRIVE BY ST PATRICK AVENUE/ HILLARD STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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DATE	2020JUL07
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PLOT DATE: 7/7/2020 3:04 PM
SAVE DATE: 7/7/2020 3:04 PM SAVED BY:

Figure 7-123
Eastbound Bike Route Sign

Figure 7-124
Overpass During Day

Figure 7-125
East Pedestrian Overpass Approach

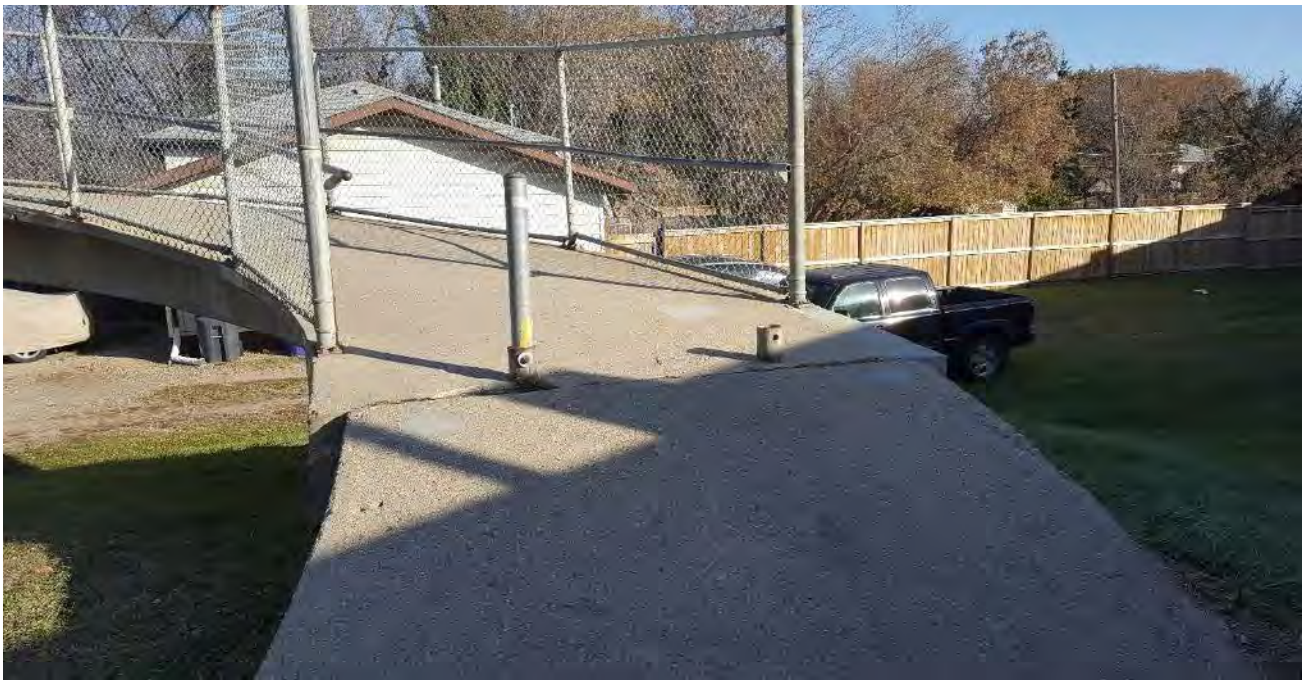

Figure 7-126
Bollards at Path Entrance

Figure 7-127
West Terminal

7.1.29 Idylwyld Dr N by 45th St

This pedestrian bridge connects two industrial neighborhoods in north Saskatoon over Idylwyld Drive N (transition to Highways 11, 12, and 16). This structure is currently only accessed by stairs and does not connect to any pedestrian facilities on Cynthia St and Northridge Dr.

Observations

- Access to the pedestrian overpass is via stairs only. See Figure 7-128.
- Overpass entrance features gates though function is unclear. A person could become trapped if gates are used with malicious intent. See Figure 7-129.
- Shared use path signs are not advised due to current access configuration. Post shared use signs once stairs have been converted to bike and mobility device accessible ramps.
- No sidewalk is provided on either Cynthia St and Northridge Dr. See Figure 7-130.
- Path is currently not well lit based on qualitative CPTED principles. Use by pedestrians or cyclists is not anticipated during the evening but low light conditions are observed during winter working hours. See Figure 7-131.

Recommendations:

368/373. Address non- standard AT overpass:

- Short term – install bike wheel ramps on both sides of stairs to better accommodate cyclists.
- Long term – remove and replace stairs with spiral or switchback ramp. This would be a multi-million dollar project and may be staged when development and land use plans or changes to travel mode split necessitate increased accommodation.

369. Remove gates at entrance to overpass unless their purpose can be explained.

370. Consider installing additional lighting dedicated to the path as the surrounding street lights are directed towards the road.

371/375. Install AT guide signs for travellers entering the pathway directing them to destination street.

372/376. Address industrial street crossing:

- Short term – install midblock curb ramps and pedestrian crossing signs.
- Long term – Install sidewalk on one side of street and realign crossing point as needed. This may be timed with road or utility work.

374. Clean litter from access and fence line.

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BEST MANAGED COMPANIES

City of Saskatoon

LEGEND:

- COMMENTS
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

IDYLWYLD DRIVE N BY 45TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-128
Stairs to Overpass

Figure 7-129
Gate at Overpass

Figure 7-130
East Overpass Terminal

Figure 7-131
Overpass During Night

7.1.30 University and College Dr

This pedestrian overpass connects University housing, parking, sports and hotel amenities to the central University campus. This bridge supports a large amount of pedestrian and cyclist traffic as part day-to-day university life.

Observations

- The approach grades on the overpass are bordering the limitations of assistive mobility device use. Auditors recorded grades of 7.5%. Grades combined with the sharp radii on the north terminal makes cycling hazardous.
- The new path to the south is misaligned with travel desire lines, terminates with a curb cut rather than a curb ramp, and does not include crossing control. See Figure 7-132.
- The overpass's concrete surface is spalling but generally in good condition.
- Signs on overpass obscure view of pedestrians from passing vehicles which normally act as natural crime deterrent.

Recommendations:

377. Reduce slope and increase radius of north terminal when bridge requires rehabilitation work. Consider widening structure simultaneously.
378. Remove and replace curb ramp to meet midblock crossing standards.
379. Consider revising sign and banner policy on pedestrian overpasses. This may require consultation with the University of Saskatchewan. See Figure 7-133.
380. Replace burnt out light at south terminal.
381. Replace temporary fencing that has collapsed or remove if this is not a part of a permanent installation.
382. Monitor new crossing to south for changes to travel patterns and desire lines. If new path does not affect pedestrian travel patterns, realign south path to connect with existing crossing, following desire line.
383. Install a curb ramp on the pedestrian landing adjacent to sporting fields.

Figure 7-132
South Terminal

Figure 7-133
Bridge During Night

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BEST MANAGED COMPANIES

City of Saskatoon

LEGEND:

- ● COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

UNIVERSITY & COLLEGE DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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7.1.31 Circle Dr & Pembina Pl/Rupert Dr

This pedestrian overpass connects two residential communities across Circle Drive E and provides additional connections to the Stew Uzelman AT bridge and Meewasin Trail.

Observations

- Sight lines on structure are frequently blocked by sound walls. See Figure 7-134.
- Purpose of paths leading southbound unclear, they do not meet standards and east path appears abandoned.
- Auditors noted more use of desire lines than existing path structures to the east and west of the underpass.

Recommendations:

384/385/386. Install AT guide signs to direct users to bridge entrance.

387/396. Install midblock curb ramps on both cul-de-sacs to allow cyclists access to path network.

388. Widen path to 3.0 m approaching the bridge.

389. Connect path network following desire lines to west. Install pedestrian crossing signs in back alleys if connections are made providing warning to motorists.

390. Install AT guide signs at path diverge providing direction to Meewasin Trail, Stew Uzelman bridge and community centres.

391. Install lighting on pathway southwest of bridge connecting to the Meewasin Trail.

392/393. Address trip hazards at bridge deck transitions by either installing asphalt shims or concrete slicing. See Figure 7-135.

394. Replace portion of sound wall with transparent panes to increase sight lines and pedestrian visibility.

395. Dissuade short-cutting on east path by regrading and landscaping with low shrubs or equivalent.

397. Revitalize and widen east path leading southbound towards river.

Figure 7-134
Proposed Location of Transparent Sound Wall

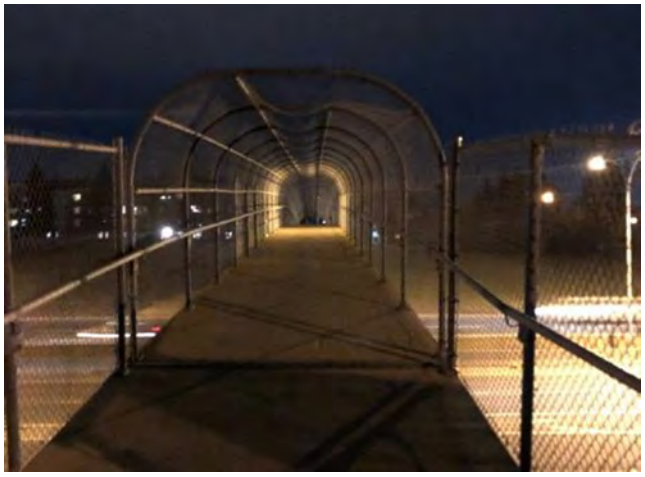

Figure 7-135
Bridge During Night

Associated Engineering

BEST MANAGED COMPANIES

Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & PEMBINA PLACE/ RUPERT DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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7.1.32 Circle Dr & Adolph Cr/Preston Crossing

This pedestrian bridge connects a residential community to commercial services and to the University of Saskatchewan. The connection passes Circle Drive E and runs parallel to the CP rail line.

Observations

- This path connection is generally in good condition. There is a trend of transverse cracking typically seen after freeze / thaw along the west leg of the corridor. This is indicative of a systematic construction issue along the corridor. See Figure 7-136.
- Infrastructure on private property displays graffiti. While this is not within City jurisdiction to control, it affects the perceived safety of the AT corridor.
- Current lighting along path is directed towards the commercial area parking lot leaving portions of the path underlit.
- Tall grasses obscure pedestrian visibility from the roadway which acts as a natural crime deterrent.
- The at-grade rail crossing to the south of site meets current standards. See Figure 7-140.

Recommendations:

398/402. Install additional lights along the corridor dedicated to path. See Figure 7-137.

399. Engage with adjacent commercial property managers to clean graffiti from garbage containment structures.

391. Reconfigure path connection to commercial property to meet directional desire lines. See Figure 7-139.

401. Remove and replace granular base and asphalt path to address repeated transverse cracking.

403. Fencing under bridge minimizes horizontal clearance on curve, adjust fencing position to maintain clearance.

404. Install additional lighting on west path between bridge and Adolph Crescent.

405. Install curb ramp and pedestrian crossing signs at Adolph Crescent across from path entrance. Install pedestrian warning signs upstream of intersection where sight lines are poor.

406. Install shared use path sign for users entering from Adolph Crescent.

407. Additional maintenance is required under bridge to address tall grasses.

408. Install additional lighting under bridge on east end of path.

Path treatment at Rutherford Crescent connection:

409. Install shared use path sign for those entering from Rutherford Crescent and Rutherford Way.

410. Short term – remove bollards at path entrance to accommodate cyclist operating envelope.

411. Short term – add pedestrian crossing signs in alley consistent with other pedestrian bridge and underpass locations.

412. Long term – extend new pathway adjacent to alley connecting to Rutherford Way. Follow existing desire lines and connect with existing midblock curb ramp. Install pedestrian crossing signs and pavement markings.

413. Install AT guide signing to direct users to path access on Rutherford Crescent.

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LEGEND:

- COMMENTS
- DESIRE LINES
- LEGAL FABRIC
- SIDEWALK RECOMMENDATIONS
- STUDY LOCATION

CIRCLE DRIVE & ADOLPH CRESCENT/ PRESTON CROSSING

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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Figure 7-136
Repeated Transverse Cracking

Figure 7-137
Gap in Lighting on Path

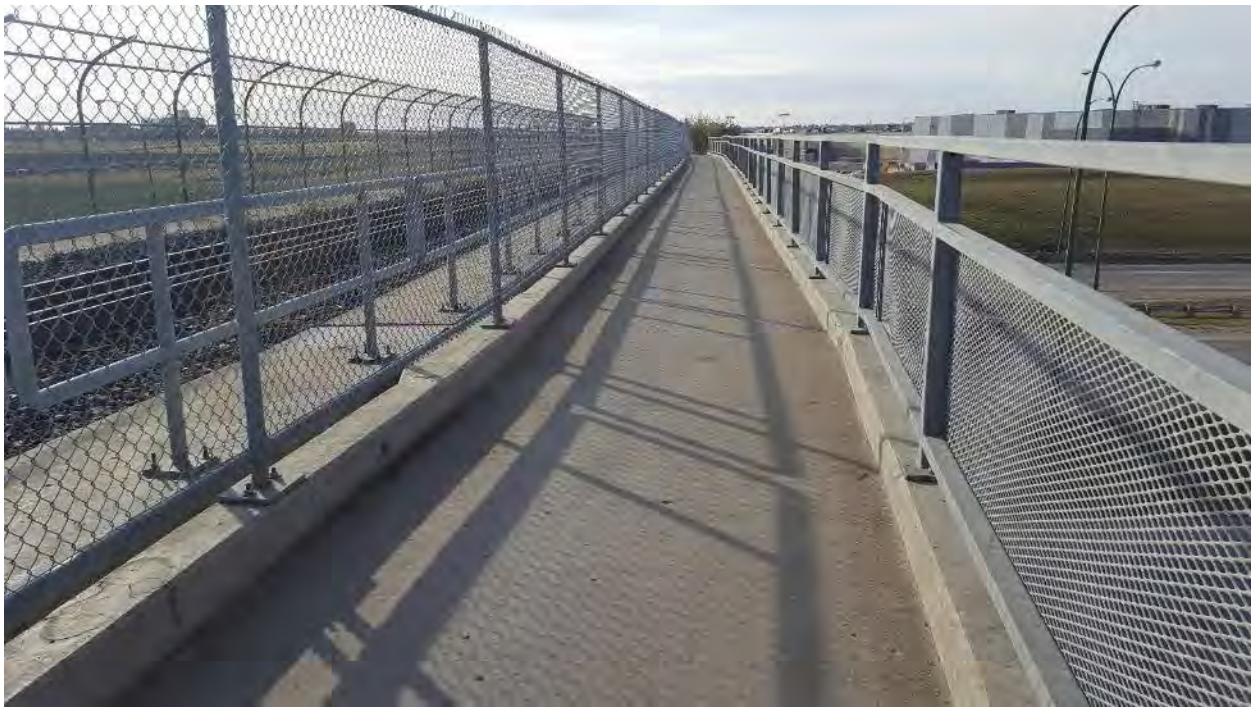

Figure 7-138
Bridge During Day

Figure 7-139
Directional Desire Line to Commercial Centre

Figure 7-140
At Grade Rail Crossing Meets Current Standards

7.1.33 Attridge Dr & Rossmo Rd/Forestry Farm Drive

This steel culvert-style underpass connects a community to institutional and recreational services across Attridge Drive. This underpass is the only location in Saskatoon where cyclists are required to dismount according to regulatory signs posted at both entrances; this does not align with current City policy.

Observations

- Underpass does not meet current TAC width or height criteria. This would require significant investment and buy-in by the City to reconstruct. Long term planning in the area should consider the total cost of replacing the underpass with an alternative that meets current standards. See Figure 7-144.
- Auditor noted signs of ponding water surrounding catch basin inlets at both underpass terminals. See Figure 7-143.

Recommendations:

414. Widen connecting paths to standard 3.0 m shared use path width.

415/416. Install AT guide signs to path diverge for community and recreational destinations.

417. Install additional low-profile lighting in underpass.

417. Address non-standard underpass:

- Short term – Repaint interior of underpass to cover graffiti and lighten travelled way,
- Long term – Reconstruct underpass to meet current width and height standards.

418/419. Remove and reinstall catch basin grates to more suitable inlet type and regrade terminals.

420. Regulatory signs asking cyclists to dismount are unique to this location. Develop cyclists traffic calming policy on bollard placement and cyclist dismount signs. See Figure 7-141.

421. Widen sidewalk between curb ramp across from Spruce Drive and underpass access to allow cyclist access, post shared use signs to encourage use.

422. Realign south path to provide more intuitive access to cyclists. Remove stairs and install switch back path to underpass entrance. See Figure 7-142.

423. Remove existing midblock curb ramp 25 m south of path as it does not serve a street of path network. See Figure 7-145.

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City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

ATTRIDGE DRIVE & ROSSO ROAD/ FORESTRY FARM DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
APPOVED	J. MEDORI
DATE	2020JUL07
REV	X
DESCRIPTION	ISSUED FOR REPORT

Figure 7-141
Cyclists Dismount Sign

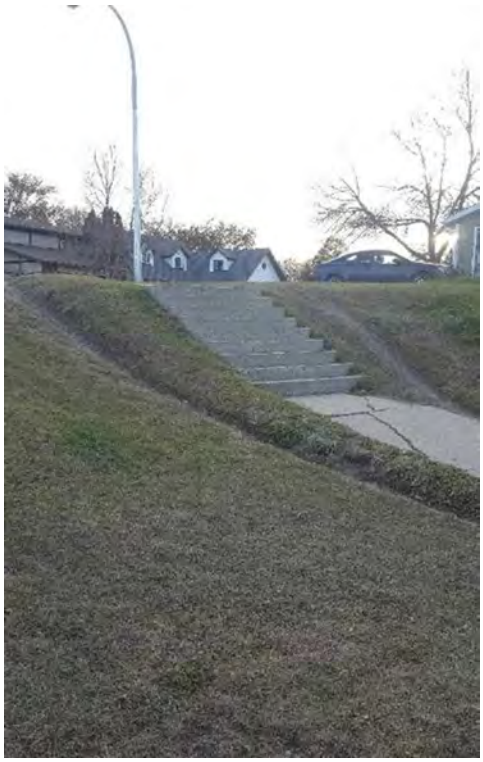

Figure 7-142
Desire Line at Stairs

Figure 7-143
Ponding and Bollards at Underpass Entrance

Figure 7-144
Low Profile Lighting in Underpass

Figure 7-145
Midblock Curb Ramp on Rossmo Road

7.1.34 Circle Dr & Clancy Dr/18th St

This box style culvert connects two communities across Circle Drive W and a rail line. The route is well advertised as a bike route along Clancy Drive and 18th Street W.

Observations

- Underpass does not meet current TAC width or height criteria for a shared use path. This would require significant investment and buy-in by both the City and CP Rail to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards. See Figure 7-147.
- There was significant litter build-up surrounding box culvert structures creating a feeling of abandonment.
- Temporary channelized intersection blocks north / south passage for persons using assistive mobility devices.
- Bike route westbound switches at intersection of Clancy Drive and Fairmont Drive from separated path to shared road with no protection or crossing control.

Recommendations:

426/429/435. Remove graffiti from bike route sign eastbound. See Figure 7-146.

430. Install AT guide signs at path diverge directing travellers to bike route and 11th Street connections.

431. Address non-standard underpass: See Figure 7-147.

- Short term – public murals on end treatments to lighten the space and invite community pride,
- Medium Term – reconstruct end treatment with additional flared to widen field of vision. See Figure 7-148.
- Long term – Reconstruct underpass to meet current width and height standards.

432. Install shared use sign and AT guide sign at underpass entry.

433. Install bike ramp mid block to access the path network. See Figure 7-149.

434. Clean litter at underpass entrance and between underpass.

436. Slopes appear to be steep enough to deter pedestrians from entering freeway and rail lines. Ongoing monitoring is recommended. If this becomes an issue, consider installing fence between underpass structures to prevent pedestrian entry to freeway and rail lines.

Improvements to the intersection of Fairmont Dr and Clancy Dr:

424. Install high entry angle slip lane with pedestrian enhancements if westbound temporary channelized right becomes permanent.

425. Refresh pavement markings for pedestrian crossing locations.

427. Install shared use path signs below bike route signs for those entering from the west.

428. Realign southeast curb ramps to facilitate east / west movement.

Outside of Scope:

- Consider further study to fill southbound desire line on east terminal connecting to sports area and community gardens. This would require significant lighting and safety features.

Figure 7-146
Bike Route Sign Eastbound

Figure 7-147
Underpass at Dusk

Figure 7-148
Underpass Entrance Feature Wide Flare

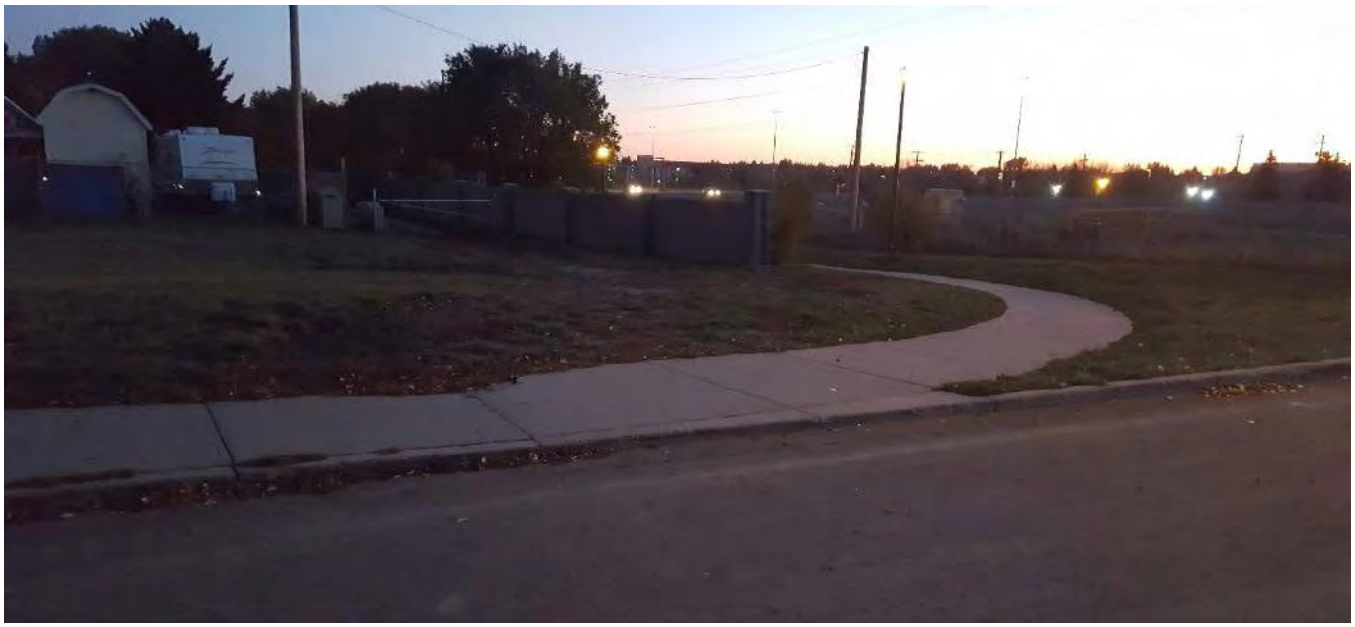

Figure 7-149
Access to Underpass from 18th Street W

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LEGEND:
- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & CLANCY DRIVE/ 18TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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7.1.35 Circle Dr & Vancouver Ave

This box culvert style pedestrian underpass connects a residential community to the Confederation shopping centre and other commercial amenities. The underpass crosses both Circle Drive W and rail lines.

Observations

- Underpass does not meet current width or height criteria. This would require significant investment and buy-in by both the City and CP Rail to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards.
- Significant short cutting was noted at both the east and west underpass terminals. Shortcutting may result in unpredictable cyclist patterns especially when entering the shopping mall parking lot.
- Sidewalk through alley provides visual and tactile designated space for pedestrian and cyclists. See Figure 7-150.

Recommendations:

437. Realign path and consider fencing at west entrance to deter cyclists short cutting between path and parking lot. Post shared use signs for users entering from private parking. See Figure 7-151.
438. Move pedestrian crossing sign into driver line of sight. This recommendation may require coordination with private property owners. See Figure 7-153.
439. Address non-standard underpass:

- Short term – Repaint interior of underpass to cover graffiti and lighten travelled way.
- Long term – Reconstruct underpass to meet current width and height standards.

439. Install additional low-profile lighting in underpass.
440. Litter has accumulated on path between Circle Drive and rail line requiring cleanup.
441. Remove graffiti in underpass under rail line.
442. Address drainage on east approach to rail underpass. Consider regrading site when earth works are required.
443. Reconstruct east approach to rail underpass from an open-air underpass to a flared end treatment to address concerns of confined space. See Figure 7-152.
444. Install fencing or handrail at switchback to deter shortcutting. See Figure 7-154.
445. Consider decommissioning one path.
446. Install AT guide sign at path diverge directing users to shopping area and adjacent community.
447. Clean graffiti from signs and post shared use signs for users entering from Vancouver Avenue
448. Remove and replace walk with alley access and curb ramp.
449. Install pedestrian crossing signs on Vancouver Ave.

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City of Saskatoon

LEGEND:

- COMMENTS
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & VANCOUVER AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
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DESCRIPTION	ISSUED FOR REPORT

PLOT DATE: 7/7/2020 3:05 PM
SAVE DATE: 7/7/2020 3:05 PM SAVED BY:

Figure 7-150
Sidewalk Through Alley

Figure 7-151
Fencing in Median

Figure 7-152
Open Air UnderpassEntrance

Figure 7-153
Access to Commercial Area

Figure 7-154
Desire Lines at Switch Back

7.1.36 Circle Dr & 29th St

This box culvert style pedestrian underpass connects two residential communities across Circle Drive W. Recent Investments at the south underpass access have significantly improved safety of users and set a good example of possible improvements at other locations.

Observations

- AT signs in east and westbound direction at north underpass entrance create sign shadow. See Figure 7-155.
- Underpass does not meet standard width or height criteria. This would require significant investment and political buy-in by both the City and CP Rail to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards. See Figure 7-156 and 7-158.
- The north entrance displays a good example of AT guide signing though it is obscured by trees. See Figure 7-157.
- Recent updates to path network include transparent sound wall and a switch back path to control cyclist speeds before entering conflict zone in back alley. See Figure 7-159.
- Pedestrian warning signs have been placed at south alley to warn motorists of conflict area.

Recommendations:

450. Recommend lowering or moving the eastbound guide sign to create clear line of sight for both signs. Trim trees obstructing signs.
451. Clear accumulation of litter at north entrance.
452. Install and update lighting in underpass, clearance is negatively impacted by depth of light fixture.
453. Address non-standard underpass:

- Short term – Repaint interior of underpass to cover graffiti and lighten travelled way,
- Long term – Reconstruct underpass to meet current width and height standards.

454. Widen switchback at south underpass entrance to accommodate cyclist operating envelope, the radius is currently too tight to comfortably navigate.
455. Apply consistent signage treatment at alley crossing, replace pedestrian warning signs with regulatory pedestrian crossing signs.
456. Post shared use path signs at path entrance.
457. Pedestrian crossing sign has been damaged at 29th Street W midblock crossing. Remove and replace.

Outside of Scope:

- Realign gravel path in Sifton Park south of study area to meet centre line of curb ramp.

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City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & 29TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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DESCRIPTION	ISSUED FOR REPORT

Figure 7-155
AT Guide Signing

Figure 7-156
Underpass During Day

Figure 7-157
Sign Shadow on North Side of Underpass

Figure 7-158
Underpass During Night

Figure 7-159
Transparent Sound Wall at Switch Back

7.1.37 Circle Dr & Edmonton Ave

This pedestrian underpass provides a dedicated space alternative to the Circle Drive and 33rd Street W interchange for AT users. Several recent access improvements have been made to the north side of the underpass including regrading, speed controlling switchbacks, and a new concrete wearing surface. Gaps in infrastructure on the south side make access for all ages and abilities difficult.

Observations:

- Underpass does not meet standard width or height criteria. This would require significant investment and buy-in by both the City and CP Rail to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards. See Figure 7-160.
- A gap in the pathway structure approximately 0.4 m wide at the south access rail crossing prevents the safe use of this facility to anyone using a bicycle or assistive mobility device.
- No crossing control is present at this rail crossing.
- Plants are growing through asphalt and a loss of path width was noted. General path maintenance is required.
- Auditors noted history of vehicle wheel path encroaching on existing shared use path on Edmonton Avenue.

Recommendations:

458. Install a midblock curb ramp at the Avenue W N cul-de-sac.

459/461. Post shared use path signs under trail etiquette sign for users entering from Ave W N and Marlborough Crescent.

460. Install AT guide signs to local community centres at path diverge.

462. Install and update lighting in underpass, clearance is negatively impacted by depth of light fixture. See Figure 7-162.

463. Address non-standard underpass:

- Short term – Repaint interior of underpass to cover graffiti and lighten travelled way.
- Long term – Reconstruct underpass to meet current width and height standards.

464. Replace light at south path switchback.

465. Remove and replace south entrance path between rail crossing and underpass to provide adequate operating space, better alignment, and standard crossing control at rail line. In this case a gate arm is most appropriate based on the constraint space of the switch back path.

466. Install AT guide sign at path diverge.

467/468. Install curb ramps on both sides of Edmonton Ave and 31st Street W.

469. Remove and replace segment of existing walk on the west side of Edmonton Ave with curb and grade separated walk to delineate between vehicular and AT asphalt areas. See Figure 7-161.

470. Replace light at south path diverge.

Outside of Scope:

- Install a separated shared use path or sidewalk on Edmonton Ave that connects 31st Street W to 33rd Street W on the west side of the road. Auditors noted this is a frequent recreational route.

- Connect new path to existing shared use path. Decommission jug handle in path once new path on Edmonton Ave has been built.
- Update AT guide sign when path northbound has been installed with local amenities.

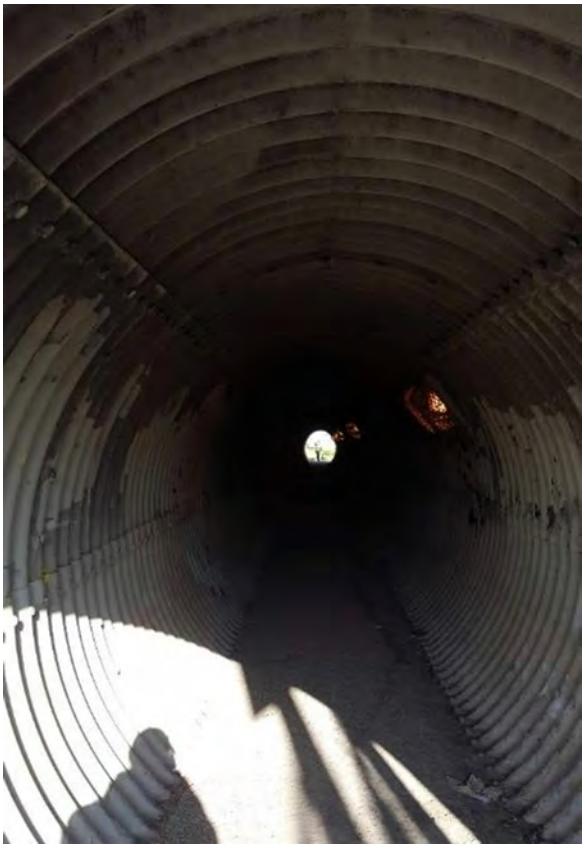


Figure 7-160
Underpass During Day

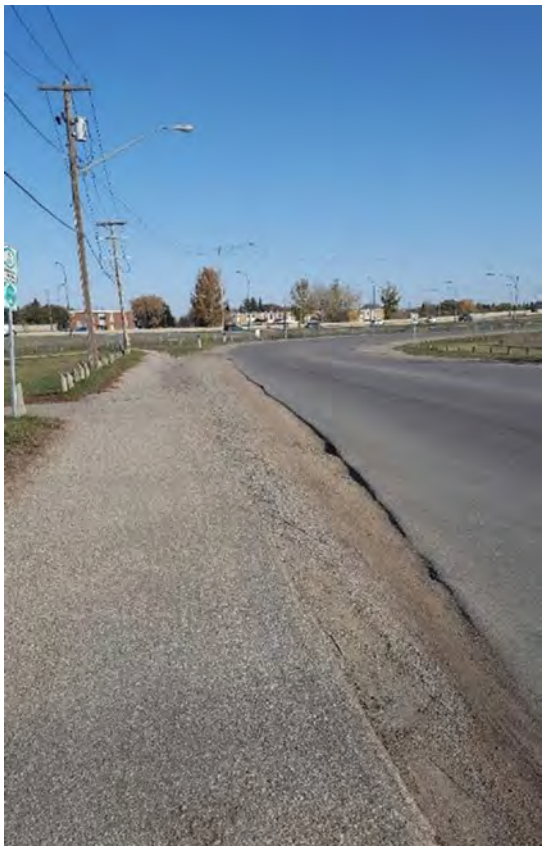
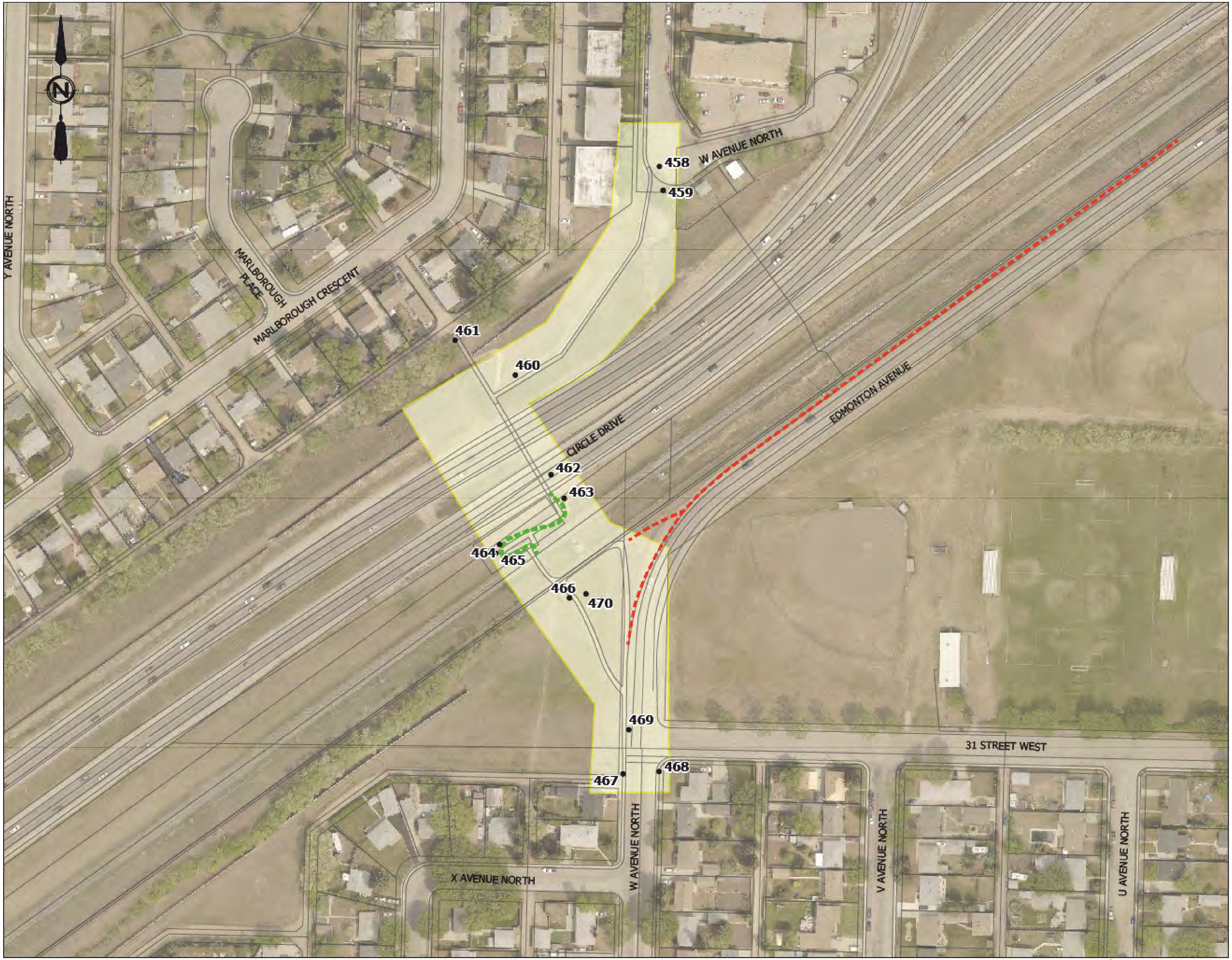


Figure 7-161
Asphalt Path Adjacent to Roadway

Figure 7-162
Underpass Lighting Reduced Clearance



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BEST MANAGED COMPANIES
Platinum member

City of Saskatoon

LEGEND:

- COMMENTS
- DESIRE LINES
- POTENTIAL GEOMETRIC CHANGES
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & EDMONTON AVENUE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

AE PROJECT No.	20194316-00
SCALE	NTS
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DESCRIPTION	ISSUED FOR REPORT

7.1.38 Idylwyld Dr & 11th Street

This dedicated pedestrian underpass connects communities on either side of Idylwyld Drive and is complemented by a bike route one block north on Saskatchewan Crescent. Pedestrian guide signs have been installed on McPherson Ave and 11th Street E and in an adjacent parking lot to the west of the underpass.

Observations:

- Underpass does not meet standard width or height criteria. This would require significant investment and political buy-in by the City to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards.
- The north west quadrant of McPherson and 11th Street has been cut back resulting in a significant exposed crossing distance in a residential neighborhood, approximately 22.9 m. While not observed during the audit, Google image history shows this radius is used as an unofficial parking bay for a nearby apartment. See Figure 7-166.
- The structures approaches cannot safely accommodate cyclists, the grade and available space of the approach create hazardous conditions increasing the chances of conflict with pedestrians. See Figure 7-163

Recommendations:

471/472/473/474. Install curb ramps at all corners of Idylwyld Crescent and 11th Street E.

475/485. Post additional AT guide signs directing pedestrians to underpass and cyclists to Saskatchewan Crescent on McPherson Ave and 11th Street E west of the underpass. See Figure 7-165.

476. Decommission walkway that connects private apartment parking to underpass. Relocate AT guide sign in parking lot to a more publicly visible location. See Figure 7-164.

477. Address non-standard underpass:

- Short term – public murals on end treatments to lighten the space and invite community pride,
- Long term – Reconstruct underpass to meet current width and height standards.

477. Install additional low-profile lighting in underpass.

478/479. Flat polished aluminum mirrors are recommended at the exit of each underpass to address short sight lines. See Figure 7-167.

480. Clean up of debris is required in the underpass structure.

481. Modify pedestrian guide signs directing cyclists to Saskatchewan Crescent as alternate route.

482/483/484. Install curb ramps at all corners of McPherson Ave and 11th Street E.

486. Address excessive crossing distance at intersection of McPherson Ave and 11th Street:

- Option 1 – Consider a mini-roundabout. This will have minimal impacts to drainage and moderate impact to exposed crossing distance.
- Option 2 – Consider removing and replacing portion of excessive roadway used for parking with a standard curb, extending landscaping and installing new sidewalk. This may impact drainage and additional analysis may be required resulting in a drainage channel or the installation of a new catch basin. This will have a significant impact to crossing distance by halving exposed pedestrian distance without compromising traffic flow.

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BEST MANAGED COMPANIES

City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- SIDEWALK RECOMMENDATIONS
- STUDY LOCATION

IDYLWYLD DRIVE & 11TH STREET

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-163
Switch Back at Entrance

Figure 7-164
Path Connection to Parking Lot

Figure 7-165
Alternate Bike Route Sign

Figure 7-166
Wide Intersection at McPherson and 11th Street

Figure 7-167
Poor Sightlines at Underpass Entrance

7.1.39 Circle Dr & Harrington Cr/Lindsay Dr

This structure is a small pedestrian underpass that connects two residential neighborhoods across Circle Drive E. The underpass is accessed through a back alley and currently has no guide signing directing pedestrians to the entrance.

Observations

- Underpass does not meet standard width or height criteria. This would require significant investment and political buy-in by the City to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards. Fee Figure 7-169.
- Walk and alley access have deteriorated on Lindsay Drive and Spinks Drive. See Figure 7-168.
- Pedestrian warning signs have been placed in both alleys to warn motorists of conflict area.
- Bollards have been posted at the entrance to the underpass with the intent to control speed of cyclists in a constrained environment through the underpass and while entering a conflict zone in the alley. See Figure 7-172.
- Asphalt path in underpass requires resurfacing due to deterioration.
- Underpass lighting during night provides low-profile, bright illumination within structure. See Figure 7-171 and 7-172.

Recommendations:

487/499. Remove and replace walk on Lindsay Drive and Spinks Drive with midblock curb ramp. Consider installing consistent alley access treatment: a 1.5 m sidewalk on the edge of travelled way providing a dedicated space to pedestrians.

488/498. Install AT guide signs on Sullivan Street, Lindsay Drive, Spinks Drive, and Harrison Street directing pedestrians to underpass entrance.

489/496. Apply consistent signs treatment at alley crossing, replace pedestrian warning signs with regulatory pedestrian crossing signs.

490/497. Install AT guide signs exiting the underpass directing pedestrians to local community centres.

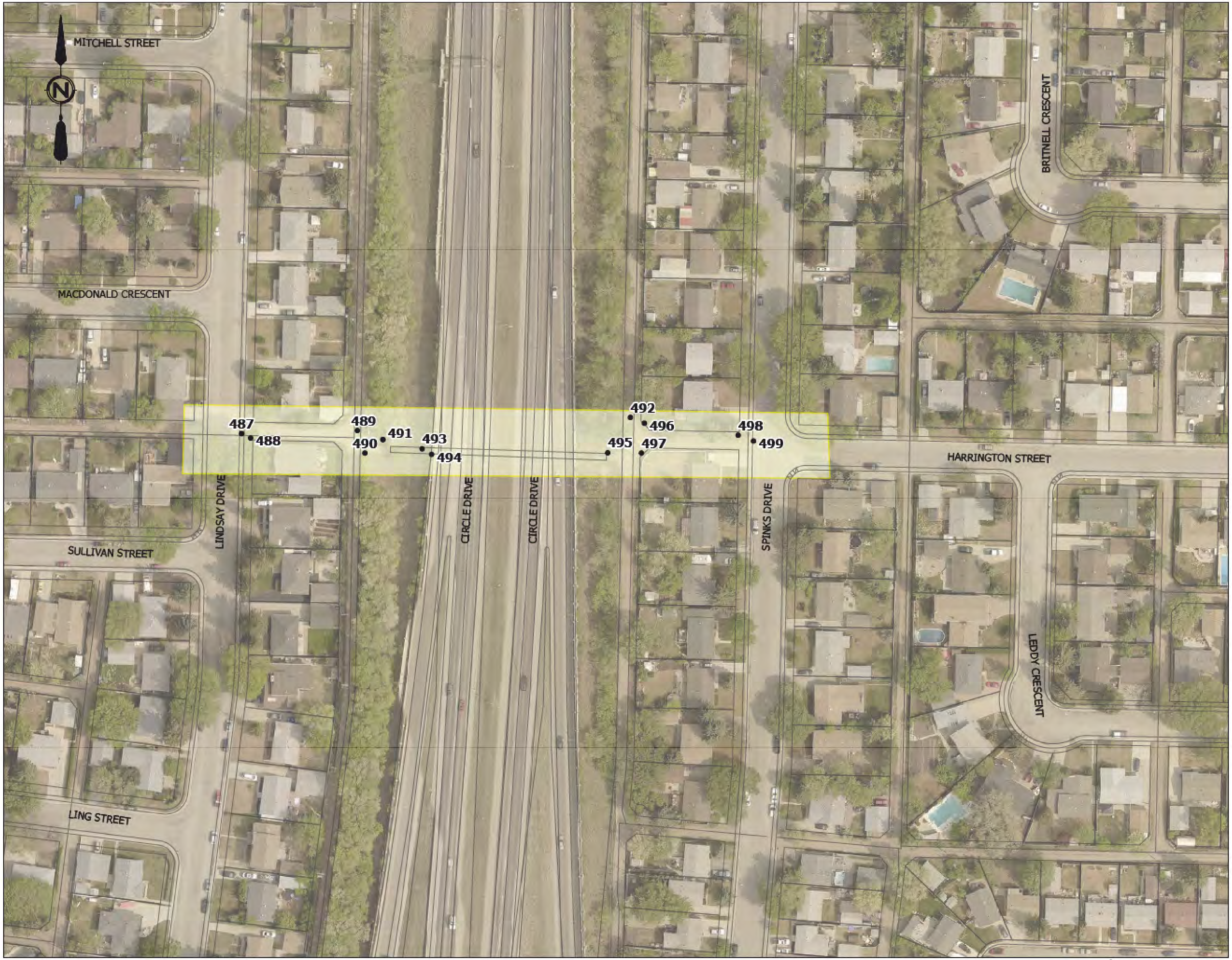
491/492. Install additional lighting in the alley on either side of underpass.

493. Remove and replace asphalt in underpass in a manner that does not decrease clearance height.

494. Develop cyclists traffic calming policy for uniform bollard placement and cyclist dismount signs.

495. Address non-standard underpass:

- Short term – Repaint interior of underpass to cover graffiti and lighten travelled way,
- Long term – Reconstruct underpass to meet current width and height standards.



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City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

CIRCLE DRIVE & HARRINGTON STREET/ LINDSAY DRIVE

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-168
Path to Underpass

Figure 7-169
Lighting in Underpass Reduces Clearance

Figure 7-170
Bollards and Bike Yield Signs at Underpass Entrance

Figure 7-171
Lighting Baskets

Figure 7-172
Underpass During Night

7.1.40 33rd Street & 10th Ave (rail underpass)

This pedestrian underpass connects communities otherwise separated by a rail line. The north and south sides of the underpass have vastly different levels of pedestrian accommodation.

Observations:

- Underpass does not meet standard width or height criteria. This would require significant investment and buy-in by both the City and CP Rail to reconstruct. Long term planning in the area should consider the total cost of replacing underpass with an alternative that meets current standards. See Figure 7-173 and 7-175.
- AT guide signs posted along the corridor provide direction to nearby parks and pedestrian routes.
- Guide signs to west of underpass are only posted in the eastbound direction of travel. See Figure 7-174.
- Curb extension is used to slow vehicles and decrease pedestrian crossing distance.
- There is no sidewalk on 10th Ave N between Warburton Street and Duchess Street, pedestrians are separated from parked cars by moveable parking barricade. See Figure 7-176.

Recommendations:

500. Mount a second sign to the back of the west guide sign pole for westbound travellers.

501/502. Replace static overhead crossing signs with activated crossing beacons or RRFB if warranted.

503. Long term –bury utilities along the corridor; poles currently block portions of curb ramps.

504. Graffiti should be cleaned from power pole.

505. Address non-standard underpass:

- Short term – public murals on end treatments to lighten the space and invite community pride,
- Medium Term – reconstruct end treatment with additional flared angle to widen field of vision.
- Long term – Reconstruct underpass to meet current width and height standards.

506. Additional low-profile lighting is recommended in the underpass as there is a gap in illumination through the most constrained travelled way.

507. Install a sidewalk or separated shared use path on the east side of 10th Ave N to provide dedicated pedestrian space.

508/509. Install fencing adjacent to rail line to prevent short cutting across rail line.

Outside of scope:

- Geotechnical review may be required as part of flared end treatment widening in medium-term solution.

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City of Saskatoon

LEGEND:

- COMMENTS
- LEGAL FABRIC
- STUDY LOCATION

33RD STREET & 10TH AVENUE (RAIL UNDERPASS)

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

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Figure 7-173
Underpass During Day

Figure 7-174
AT Guide Signs

Figure 7-175
End Treatment on Underpass Facing Northbound

Figure 7-176
Pedestrian Area on 10th Ave N

8 RECOMMENDATIONS REQUIRING FURTHER INVESTIGATION

Some recommendations identified through this audit and study require further investigation outside of the confines of this project. High level recommendations requiring further investigation are summarized here. Out of scope recommendations made at the site level also require further investigation as they are not included in the following list. Recommendations requiring further study include:

- Conduct a conflict assessment at the intersection of Taylor Street and Arlington Avenue to determine underlying high-risk behaviours and conflict patterns leading to high number of collisions.
- The installation or calibration of signal detectors to accommodate cyclists on the roadway.

9 COST ASSESSMENT

Cost estimates for each site are provided in Appendix C. It should be noted that costs aren't included for all recommendations. This is due to several factors as follows:

- Costs for general maintenance items such as graffiti cleanup, replacing lights and tree trimming are not included.
- Costs to replace conventional channelization with high entry angle slip ramps are not included. The City is in the process of developing a standard for high entry slip ramps. Also, the intersection should be looked at as a whole, to address any operational issues along with island reconfiguration, and this could have a significantly impact on the cost of the upgrades.
- Costs for intersection upgrades where option analysis is required are not included as the costs could vary significantly depending on which option is selected.
- The cost to address non-standard underpasses is not included. There are a lot of site specific factors that would require significant additional investigation involved in this work. These factors could have a significant effect on the cost.

In addition to the above considerations, it should also be noted that the unit rates that were used could vary significantly depending on the scale of work that is being done.

The City requested conceptual design for ramps leading up to the Idylwyld Drive at 45th Street and College Drive at Central Avenue pedestrian overpasses. The conceptual design along with cost estimates are included in Appendix D.

10 CITY TECHNICAL WORKSHOP

A workshop was held on July 29, 2020. During the workshop, the study process was reviewed along with some system wide recommendations. Case studies were also presented for each type of crossing including a minor bridge structure, a major bridge structure, a pedestrian bridge, and a pedestrian underpass. The collision analysis and risk assessment were also reviewed along with the outcomes of the audit. No changes were made to the report or recommendations as a result of the discussions.

CLOSURE

This report was prepared for the City of Saskatoon to present the results of the bridge shared use path audit.

The services provided by Associated Engineering (Sask.) Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Engineering (Sask.) Ltd.

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APPENDIX A - AUDIT REPORTS

The field audit reports are attached in a separate file to reduce the length of this document.

APPENDIX B - RISK ASSESSMENT

Name of Structure	Location #	Main Risk	Cycling Defects Risk	Pedestrian Defects Risk	UE Risk	Total Risk Score	Normalized Score	calculated column	Final Risk Score
9 Circle Dr & Warman Rd	9	4.2	1.0	1.0	1.8	2.9	2.2	4.3	9.0
12 Circle Dr & 8th St	12	3.3	1.0	3.0	1.6	2.7	1.5	3.5	7.4
24 Clarence Ave S - railway	24	3.5	1.0	2.0	1.7	2.7	1.5	3.5	7.4
8 Circle Drive E & Idylwyld Dr N	8	3.8	1.0	1.0	1.7	2.7	1.5	3.5	7.4
22 Idylwyld Dr & 8th St/Lorne Ave	22	3.5	1.0	2.0	1.4	2.7	1.4	3.4	7.2
37 Circle Dr & Edmonton Ave	37	2.9	2.0	3.0	1.5	2.6	1.2	3.2	6.8
13 Circle Dr & Taylor St	13	3.2	2.0	2.0	1.6	2.6	1.2	3.2	6.8
18 Circle Dr & 22nd St	18	3.7	1.0	1.0	1.3	2.6	1.1	3.2	6.7
19 Circle Dr & 33rd St	19	3.3	1.0	2.0	1.6	2.5	1.0	3.0	6.4
29 Idylwyld Dr N by 45th St	29	3.2	1.0	1.0	2.2	2.4	0.7	2.7	5.7
28 Idylwyld Dr by St Patrick Ave/Hilliard St	28	3.0	1.0	2.0	2.1	2.4	0.6	2.7	5.6
36 Circle Dr & 29th St	36	2.9	1.0	3.0	1.3	2.4	0.6	2.7	5.6
23 McKercher Dr & College Dr	23	3.3	1.0	1.0	1.7	2.4	0.6	2.6	5.5
20 Idylwyld Dr & Lorne Ave/Ruth St	20	2.9	1.0	2.0	1.9	2.4	0.4	2.4	5.1
33 Attridge Dr & Rosso Rd/Forestry Farm Drive	33	3.0	1.0	2.0	1.5	2.4	0.4	2.4	5.1
17 Circle Dr & 11th St	17	2.9	1.0	2.0	1.6	2.3	0.3	2.3	4.9
3 University Bridge	3	3.2	1.0	1.0	1.5	2.3	0.2	2.2	4.7
14 Circle Dr & Preston Ave	14	3.2	1.0	1.0	1.5	2.3	0.2	2.2	4.7
15 Circle Dr & Clarence Ave	15	2.9	1.0	2.0	1.3	2.3	0.2	2.2	4.6
4 Broadway Bridge	4	3.2	1.0	1.0	1.3	2.3	0.1	2.1	4.5
6 Sid Buckwold Bridge	6	2.8	1.0	2.0	1.3	2.2	0.0	2.0	4.3
38 Idylwyld Dr & 11th Street	38	2.8	1.0	1.0	1.6	2.1	-0.3	1.7	3.6
32 Circle Dr & Adolph Cr/Preston Crossing	32	2.7	1.0	2.0	1.1	2.1	-0.4	1.6	3.5
31 Circle Drive & Pembina Pl/Rupert Dr	31	2.6	1.0	2.0	1.2	2.1	-0.5	1.5	3.3
35 Circle Dr & Vancouver Ave	35	2.8	1.0	1.0	1.6	2.1	-0.5	1.5	3.3
25 College Dr & Central	25	2.8	1.0	1.0	1.5	2.1	-0.5	1.5	3.2
34 Circle Dr & Clancy Dr/18th St	34	2.7	1.0	1.0	1.8	2.1	-0.6	1.5	3.1
40 33rd Street & 10th Ave (rail underpass)	40	2.7	1.0	1.0	1.7	2.1	-0.6	1.4	3.0
27 22nd St by Shaw Centre	27	2.7	1.0	1.0	1.6	2.1	-0.6	1.4	3.0
2 CPR Bridge	2	2.7	1.0	1.0	1.5	2.0	-0.7	1.4	2.9
30 University and College Drive	30	2.5	2.0	1.0	1.1	2.0	-0.7	1.3	2.8
10 Circle Dr & 108th St	10	2.6	1.0	1.0	1.5	2.0	-0.8	1.2	2.6
11 Circle Dr & 14th St	11	2.4	1.0	2.0	1.4	2.0	-0.9	1.2	2.5
21 Idylwyld Dr & Taylor St	21	2.5	1.0	1.0	1.8	2.0	-0.9	1.2	2.5
16 Circle Dr & Lorne Ave	16	2.2	1.0	2.0	1.5	1.9	-1.1	1.0	2.0
26 22nd St W by Circle Dr	26	2.5	1.0	1.0	1.1	1.9	-1.3	0.7	1.5
39 Circle Dr & Harrington Cr/Lindsay Dr	39	2.4	1.0	1.0	1.4	1.8	-1.3	0.7	1.5
1 Circle Drive North/Stew Uzelman Pedway	1	2.4	1.0	1.0	1.3	1.8	-1.3	0.7	1.4
5 Traffic Bridge	5	2.2	1.0	1.0	1.2	1.7	-1.7	0.3	0.7
7 Gordie Howe Bridge	7	2.1	1.0	1.0	1.1	1.6	-2.0	0.0	0.0

Main Data Scoring

Degree of Separation		**Score**	**Weight**	**Weighted Score**	
1- Pedestrian and cyclist shared space	M	2	4	8	
2 - Pedestrians have dedicated space, cyclists and cars share	H	3		12	
3- each have dedicated space	L	1		4	
4 - all share	H	3		12	
Walkway Space					
Narrowest travelway (average or most constrained, peds or cyclists)		**Score**	**Weight**	**Weighted Score**	
Less than 1.5 m	H	3	4	12	
between 1.5 and 3 m	M	2		8	
3 m or wider	L	1		4	
Roadway Speed/Buffer		**Score**	**Weight**	**Weighted Score**	
No buffer	H	3	4	12	
Speed > 50, barrier <1m	M	2		8	
Speed 50 or not listed	L	1		4	
Channelized Intersection Risk		**Score**	**Weight**	**Weighted Score**	
Any Channelized Right Turns	H	3	1	3	
No Channelized Right Turns	L	1		1	
Where applicable are approach radii appropriate for cyclist making turning movements (cyclist operating space = 1.5m + .45m on either side for turning space)		**Score**	**Weight**	**Weighted Score**	
Yes / not applicable	L	1	1	1	
No	M	2		2	
Do access management practices detract from safety		**Score**	**Weight**	**Weighted Score**	
Yes	H	3	1	3	
No / not applicable	L	1		1	
Abrupt Barrier Risk		**Score**	**Weight**	**Weighted Score**	
Abrupt End, Risk to Cyclist	H	3	1	3	
Abupt End, Low Risk to Cyclist	M	2		2	
No Abrupt end	L	1		1	
Impression of lighting?		**Score**	**Weight**	**Weighted Score**	
Poor	H	3	1	3	
Fair	M	2		2	
Good	L	1		1	
Are there places where someone could be hiding?		**Score**	**Weight**	**Weighted Score**	
Yes	H	3	1	3	
No	L	1		1	
Can you tell what is at the other end of the path / ramp / bridge		**Score**	**Weight**	**Weighted Score**	
Yes	L	1	1	1	
No	M	2		2	
As a cyclist does it feel safe to travel on the road?		**Score**	**Weight**	**Weighted Score**	
Yes / not applicable/blank	L	1	1	1	
No	H	3		3	
As a pedestrian does it feel safe to travel on the designated walkway?		**Score**	**Weight**	**Weighted Score**	
Yes / not applicable/blank	L	1	1	1	
No	H	3		3	
Risk Factor sum			13	67	max points
Collisions		**Score**	**Weight**	**Weighted Score**	
H	H	3	2	6	
M	M	2		4	
L	L	1		2	

Main Data Scoring

Site	Main Risk Factor	Collision History	Degree of Separation	Walkway Space	Roadway Speed/Buffer	Chanellized Intersection Risk	Approach Radii cycling	Access management	Abrupt Barriers	Lighting Impression	Places to hide?	See to other end?	Cyclist - Generally safe?	Pedestrian - Generally Safe?
1	2.4	4.0	8	4	4	1	1	1	1	1	3	1	1	1
2	2.7	2.0	8	8	4	1	2	1	2	1	1	1	3	1
3	3.2	4.0	12	8	4	3	1	1	1	1	3	1	1	1
4	3.2	4.0	12	8	4	3	1	1	1	1	3	1	1	1
5	2.2	2.0	4	8	4	3	1	1	1	1	1	1	1	1
6	2.8	4.0	8	8	4	1	1	1	3	1	3	1	1	1
7	2.1	2.0	8	4	4	1	1	1	1	1	1	1	1	1
8	3.8	4.0	12	12	4	3	2	3	2	1	3	1	1	1
9	4.2	6.0	12	12	12	3	1	1	1	1	1	2	1	1
10	2.6	4.0	4	8	4	3	1	1	3	1	1	2	1	1
11	2.4	4.0	4	8	4	3	1	1	1	1	1	1	1	1
12	3.3	6.0	12	12	4	1	1	1	1	1	1	1	1	1
13	3.2	6.0	12	8	4	3	1	1	1	1	1	1	1	1
14	3.2	2.0	12	8	8	3	1	1	1	1	1	1	1	1
15	2.9	2.0	12	4	8	3	2	1	1	1	1	1	1	1
16	2.2	2.0	4	4	8	3	1	1	1	1	1	1	1	1
17	2.9	2.0	12	4	4	3	1	3	2	1	1	1	3	1
18	3.7	6.0	12	8	8	3	2	1	2	2	1	1	1	1
19	3.3	6.0	12	4	4	3	2	1	2	1	3	1	1	3
20	2.9	4.0	12	4	4	1	1	3	1	2	3	1	1	1
21	2.5	2.0	12	4	4	1	1	3	1	1	1	1	1	1
22	3.5	4.0	12	12	4	3	2	1	3	1	1	1	1	1
23	3.3	2.0	12	8	4	3	1	1	2	1	3	2	3	1
24	3.5	2.0	12	12	4	3	1	1	3	1	1	2	3	1
25	2.8	2.0	8	8	4	3	1	3	1	1	1	2	1	1
26	2.5	2.0	8	8	4	1	1	1	2	1	1	1	1	1
27	2.7	2.0	8	8	4	1	1	3	1	1	3	1	1	1
28	3.0	2.0	8	12	4	1	1	1	1	2	1	2	3	1
29	3.2	2.0	8	12	4	1	1	1	2	3	1	1	3	3
30	2.5	2.0	8	8	4	1	1	1	1	1	3	1	1	1
31	2.6	2.0	8	8	4	1	1	1	1	1	3	2	1	1
32	2.7	2.0	8	8	4	1	1	1	2	1	3	2	1	1
33	3.0	2.0	8	12	4	1	1	1	2	2	3	1	1	1
34	2.7	2.0	8	8	4	3	1	1	1	1	3	1	1	1
35	2.8	2.0	8	8	4	1	1	3	1	2	3	1	1	1
36	2.9	2.0	8	8	4	1	2	3	1	2	3	2	1	1
37	2.9	2.0	8	8	4	1	2	1	1	2	3	2	1	3
38	2.8	2.0	8	8	4	1	2	1	1	2	3	1	3	1
39	2.4	2.0	8	8	4	1	1	1	1	1	1	1	1	1
40	2.7	2.0	8	8	4	1	1	1	1	3	3	1	1	1

Pedestrian and Cycling Defect Scoring

Defects Scoring:				
# defects	Score		Weight	Weighted Score
1 or 0		1	1	1
	2	2		2
>2		3		3
Defects Severity Score:				
Severity	Score		Weight	Weighted Score
Good		1	1	1
Fair		2		2
Poor		3		3
Defect factor				
=defect score * severity score				

Risk Factor	Risk Rating	Risk Score
1	Low	1
2	Low	1
3	Medium	2
4	Medium	2
6	High	3
9	High	3

Pedestrian and Cycling Defect Scoring

Site	Cycling Defect Count Score	Average Cycling Defect Score	Cycling Defect Factor	Cycling Defect Risk	Pedestrian Defect Count Score	Average Pedestrian Defect Score	Pedestrian Defect Factor	Pedestrian Defect Risk
1	#N/A	#N/A	1	1	1	1	1	1
2	#N/A	#N/A	1	1	1	1	1	1
3	#N/A	#N/A	1	1	#N/A	#N/A	1	1
4	#N/A	#N/A	1	1	#N/A	#N/A	1	1
5	#N/A	#N/A	1	1	#N/A	#N/A	1	1
6	1	2	2	1	3	1.8	5.4	2
7	#N/A	#N/A	1	1	1	1	1	1
8	#N/A	#N/A	1	1	1	2	2	1
9	#N/A	#N/A	1	1	1	2	2	1
10	#N/A	#N/A	1	1	#N/A	#N/A	1	1
11	#N/A	#N/A	1	1	2	2	4	2
12	#N/A	#N/A	1	1	3	3	9	3
13	1	3	3	2	2	2	4	2
14	#N/A	#N/A	1	1	1	2	2	1
15	#N/A	#N/A	1	1	2	2	4	2
16	#N/A	#N/A	1	1	2	2	4	2
17	1	1	1	1	1	3	3	2
18	1	2	2	1	#N/A	#N/A	1	1
19	1	1	1	1	2	1.5	3	2
20	1	2	2	1	2	2.5	5	2
21	1	1	1	1	1	2	2	1
22	1	1	1	1	2	2	4	2
23	1	2	2	1	#N/A	#N/A	1	1
24	1	2	2	1	1	3	3	2
25	#N/A	#N/A	1	1	1	1	1	1
26	#N/A	#N/A	1	1	#N/A	#N/A	1	1
27	#N/A	#N/A	1	1	#N/A	#N/A	1	1
28	#N/A	#N/A	1	1	2	1.5	3	2
29	#N/A	#N/A	1	1	1	1	1	1
30	1	3	3	2	1	2	2	1
31	#N/A	#N/A	1	1	2	1.5	3	2
32	#N/A	#N/A	1	1	2	2.5	5	2
33	#N/A	#N/A	1	1	2	1.5	3	2
34	#N/A	#N/A	1	1	1	1	1	1
35	1	2	2	1	1	1	1	1
36	0	1	0	1	3	2	6	3
37	1	3	3	2	3	2.714285714	8.142857143	3
38	1	2	2	1	1	2	2	1
39	#N/A	#N/A	1	1	1	2	2	1
40	#N/A	#N/A	1	1	1	1	1	1

UE Data Scoring

1 UE-Can users cross safely at bridge if desired?

Description	Score	Weight	Weighted Score
Any other response	1	5	5
No	3		15

2 UE-Sight line ranking

Description	Score	Weight	Weighted Score
Good	1	1	1
Fair	2		2
Poor	3		3

3 UE-Total exposed crossing distance

Description	Score	Weight	Weighted Score
0-10 m	1	5	5
10-20 m	2		10
>20 m	3		15

4 UE-Does crossing point use bollards or other obstructions to protect against errant vehicles?
UE - If yes, is the risk of a motorized vehicle higher than the risk of fixed objects in the traveled way?

Description	Score	Weight	Weighted Score
No bollards	1	1	1
Bollards are present and motorized vehicle risk higher	2		2
Bollards are present, motorized vehicle risk is lower	3		3

5 UE- Do paths dead end shortly after the structure or is there line continuity?
Highest risk code gives score.

Code	Description	Score	Weight	Weighted Score
1	Path dead end,	3	1	3
2	Misaligned route continuity,	3		3
3	Curb ramps line up with each other	1		1
4	Roadway obstacles midway through path	3		3
5	Forced crossing	2		2
6	Crossing is prohibited	1		1
7	Sharp radii on path	2		2
8	Clear pathway	1		1
	Other, please specify			

6 UE- Is there a refuge space at each of the terminal crossing points?

Description	Score	Weight	Weighted Score
No	3	2	6
Yes: It can fit one user	2		4
Yes: It can fit two or more users	1		2
	1		2

7 UE- Do crossing areas include pedestrian ramps or curb ramps?
Highest risk code gives score.

Code	Description	Score	Weight	Weighted Score
1	Pedestrian ramp provided at stairs	1	1	1
2	No pedestrian ramp provided at stairs	3		3
3	Curb ramps provided at crossing	1		1
4	Curb ramps provided but does not meet spec	2		2
5	Ramp is free of standing water	1		1
6	Ramp has standing water	2		2
7	No curb ramps provided	3		3

8 UE - What safety measures are applied at each crossing?
Options list various safety measures.
Option 5 is "No Safety Features"

	Score	Weight	Weighted Score
Score of 5 is present	3	2	6
Any other scores	1		2

9 UE - How many cyclist/pedestrian conflict points are there?

#	Score	Weight	Weighted Score
0 - 3	1	1	1
4- 6	2		2
7- 9	3		3

Total Items 9

UE Data Scoring

Name of Structure	Location Description	UE Risk Factor	UE-Can users cross safely at bridge if desired?	UE-Sight line ranking	UE-Total exposed crossing distance	Bollards Safety - Combined item	UE- Do paths dead end shortly after the structure or is there line continuity?	UE- Is there a refuge space at each of the terminal crossing points?	UE- Do crossing areas include pedestrian ramps or curb ramps?	UE - What safety measures are applied at each crossing?	UE - How many cyclist/pedestrian conflict points are there?	
1	SE	1.4	5	1	10	1	1	4	2	2	1	
1	NW	1.3	5	1	5	1	3	4	1	2	2	
2	SW	2.3	15	1	15	1	3	2	3	2	1	
2	West	1.1	5	2	5	1	1	2	1	2	1	
2	Central-west	1.3	5	1	5	3	3	2	3	2	1	
3	East	1.4	5	1	10	1	1	4	1	2	1	
3	SW	1.3	5	1	10	1	2	2	1	2	1	
3	NW	1.6	5	1	15	1	1	2	1	2	2	
3	SE	1.7	5	1	15	1	2	2	2	2	2	
4	NE	1.1	5	1	5	2	1	2	1	2	1	
4	SE	1.4	5	1	10	3	1	2	1	2	1	
4	SW	1.5	15	1	5	1	1	2	1	2	1	
5	North	1.1	5	1	5	1	1	2	1	2	3	
5	South	1.4	5	1	10	1	1	2	1	2	3	
6	South	1.2	5	1	5	1	1	4	3	2	1	
6	South-central	1.8	15	2	5	1	1	4	3	2	1	
6	SW	1.1	5	1	5	1	1	4	1	2	1	
6	South terminal at McPherson ave	1.2	5	2	5	1	1	2	3	2	1	
7	North	1.3	5	2	5	1	1	4	3	2	1	
7	NW	1.0	5	1	5	1	1	2	1	2	1	
8	East	1.5	5	2	10	1	2	4	2	2	1	
8	NE	1.6	5	2	10	1	3	4	2	2	1	
8	NC	1.8	5	1	15	1	3	4	2	2	2	
8	SW	1.9	5	1	15	1	3	4	3	2	3	
9	South-central	1.8	5	1	15	1	2	4	2	2	2	
9	North	1.8	5	1	15	1	2	4	2	2	2	
10	South	1.5	5	1	10	1	2	4	2	2	1	
10	West	1.6	5	2	10	1	3	4	2	2	1	
11	East	1.3	5	1	10	1	1	2	1	2	1	
11	Central terminal north side	1.3	5	1	10	1	1	2	1	2	1	
11	West terminal on north side	1.6	5	1	15	1	1	4	1	2	1	
12	Far East street crossing	1.4	5	1	10	1	1	4	2	2	1	
12	Central terminal north side east of circle drive. East-west.	1.4	5	1	10	1	1	4	2	2	1	
12	Central terminal east-west east of circle dr. south side.	1.4	5	1	10	1	1	4	2	2	1	
12	Central terminal west of circle dr	1.4	5	1	10	1	1	4	2	2	1	
12	Central terminal north side west of circle dr.	1.8	5	1	15	1	3	4	2	2	1	
12	West terminal	1.8	5	1	15	1	3	4	2	2	1	
12	East terminal crossing 8th north-south	1.7	5	1	15	1	1	4	3	2	1	
12	Central north south crossing west of circle.	1.7	5	1	15	1	1	4	3	2	1	
12	Centre crossing north-south west of circle dr.	1.8	5	1	15	1	3	4	3	2	1	
13	East terminal crossing 8th to co-op.	1.4	5	1	10	1	1	4	2	2	1	
13	Central terminal south side west of Curcle Dr.	1.5	5	1	10	1	3	4	2	2	1	
13	Central terminal east of circle	1.4	5	1	10	1	1	4	2	2	1	
13	Central terminal north side. West of circle drive.	1.4	5	1	10	1	1	4	2	2	1	
13	Central terminal east of Circle Dr.	1.7	5	1	15	1	1	4	2	2	1	
13	Far west crossing Taylor St.	1.7	5	1	15	1	1	4	2	2	1	
13	Central terminal east of circle crossing Taylor.	1.7	5	1	15	1	1	4	2	2	1	
13	Central west of circle crossing Taylor	1.6	5	1	15	1	1	4	1	2	1	
14	East terminal crossing Taylor St.	1.5	5	2	10	1	1	4	3	2	1	
14	Far north street crossing	1.3	5	1	10	1	1	2	1	2	2	
14	South terminal south of bridge structure	1.6	5	1	15	1	1	2	1	2	2	
15	North terminal crossing east-west across Preston	1.3	5	1	10	1	1	2	1	2	1	
15	North terminal crossing access ramp from circle	1.4	5	1	10	1	2	4	1	2	1	
16	Southern terminal cross ramps that access circle drive for vehicles.	1.5	5	1	15	1	1	2	1	2	1	
16	Northern terminal crossing two roads with two islands.	1.5	5	1	15	1	1	2	1	2	1	
17	Southern street crossing	1.6	5	1	15	1	1	4	1	2	1	
17	Eastern terminal	1.6	5	1	15	2	1	2	1	2	1	
17	North-central	1.7	5	1	15	1	3	2	1	2	2	
18	SW	1.1	5	1	5	1	1	4	1	2	1	
18	North north terminal near McDonald's clearc	1.1	5	2	5	1	1	2	1	2	1	
18	Middle terminal	1.7	5	1	15	1	3	2	1	2	2	
18	North-central	1.7	5	1	15	1	3	2	1	2	3	
18	West	1.2	5	2	5	1	3	2	1	2	1	
19	NNW	1.5	5	1	10	1	2	4	2	2	1	
19	Southbound Offramp	1.5	5	1	10	1	3	4	2	2	1	

19	Northbound Onramp	1.5	5	1	10	1	3	4	1	2	1
19	Southbound Onramp	1.8	5	1	15	1	3	4	2	2	1
19	Northbound Offramp	1.6	5	1	10	1	2	4	2	2	3
19	NW	1.8	5	1	15	1	1	4	2	2	3
19	SE	1.3	5	2	5	1	1	4	2	2	3
20	NE	1.9	15	1	10	1	1	4	1	2	2
20	Ruth and st George	2.1	15	1	10	1	1	4	3	2	2
20	Ruth and vernon	1.7	5	1	15	1	1	4	1	2	3
20	Lorne and ruth south	1.7	5	1	15	1	1	4	1	2	3
21	Lorne and ruth	1.5	5	1	10	1	3	4	2	2	1
21	East terminal road crossing north side of road	2.2	15	1	10	1	3	4	2	2	3
21	SW	2.1	15	1	10	1	3	4	1	2	3
21	NW	1.2	5	1	5	1	1	4	3	2	1
22	Far East crossing alley	1.4	5	1	5	1	3	6	3	2	1
22	West side of freeway	1.2	5	2	5	1	1	4	1	2	1
22	West terminal crossing to Lauren from trail along freeway	1.5	5	1	10	1	1	4	3	2	1
22	Central terminal crossing island to Lauren ave	1.6	5	1	15	1	1	2	1	2	2
22	Eastmost crossing	1.4	5	1	10	1	3	2	1	2	2
22	NW	1.5	5	1	10	1	1	4	3	2	2
23	Coy and 8th	1.9	15	1	10	1	1	4	2	2	1
23	Central	1.4	5	1	10	1	1	4	1	2	2
23	South	1.8	15	1	5	1	3	4	1	2	2
24	North	1.7	15	1	5	1	3	2	3	2	1
24	South	1.6	5	1	10	1	3	4	2	2	3
25	South	1.6	5	2	10	1	1	6	3	2	1
25	Central - north	1.2	5	1	5	1	1	4	3	2	1
25	South	1.7	5	1	10	1	3	6	3	2	2
26	North	1.1	5	1	5	1	1	2	3	2	1
27	South	1.4	5	1	10	1	1	4	2	2	1
26	North terminal at street	1.2	5	2	5	1	1	2	3	2	1
27	North terminal	1.6	15	1	5	1	1	2	3	2	1
27	Centre	1.8	15	1	5	1	3	4	2	2	1
28	North	1.9	15	1	10	2	1	4	1	2	1
28	East	2.2	15	1	10	3	3	4	1	2	2
29	West	2.2	15	1	10	1	3	6	3	2	1
29	East	2.2	15	1	10	1	3	6	3	2	1
30	West	1.0	5	1	5	1	1	2	1	2	1
30	North terminal	1.2	5	1	5	1	3	4	1	2	1
31	South road crossing.	1.4	5	1	5	1	2	6	3	2	1
31	North	1.1	5	1	5	1	1	2	3	2	1
32	South	1.3	5	1	5	1	3	4	3	2	1
32	East	1.1	5	1	5	1	1	2	1	2	2
32	West	1.1	5	1	5	1	1	2	3	2	1
32	west side	1.0	5	1	5	1	1	2	1	2	1
33	east terminal	1.3	5	2	5	3	1	2	3	2	1
33	North	1.8	15	1	5	3	3	2	3	2	1
33	South	1.5	5	2	5	3	1	2	3	6	1
34	north terminal	1.1	5	2	5	1	2	2	1	2	1
34	Centre	2.1	15	1	10	1	3	4	2	2	1
34	West	2.2	15	1	10	1	3	6	1	2	2
35	East	1.4	5	2	10	1	1	4	1	2	1
35	West (to mall parking)	1.3	5	1	5	1	1	6	3	2	1
35	Centre	2.1	15	1	10	1	2	4	2	2	3
36	East	1.4	5	2	5	3	1	4	3	2	1
36	Middle terminal 4.8	1.4	5	1	10	1	1	4	1	2	1
36	East	1.3	5	2	5	1	1	4	3	2	1
37	North side to back alley	1.5	5	1	10	1	2	4	3	2	1
38	East	1.1	5	1	5	1	1	4	1	2	1
38	West underpass entrance	2.4	15	1	15	1	1	4	3	2	3
38	East	1.4	5	2	5	1	3	4	3	2	1
39	West terminal sidewalk and street	1.4	5	2	5	1	1	2	3	6	1
39	East alley crossing	1.2	5	2	5	1	1	2	3	2	1
39	West alley crossing	1.5	5	2	10	1	1	4	3	2	1
39	Far East street crossing	1.5	5	2	10	1	1	4	3	2	1
40	Far west street crossing	2.0	15	1	10	1	3	2	3	2	1
40	South	1.3	5	1	10	1	1	2	1	2	2

APPENDIX C - COST ESTIMATES

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 1 - Circle Drive North/Stew Uzelman Pedway

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
1.2	Pavement Markings	LS	1	$740.00	$740.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	30	$115.00	$3,450.00
2.2	Grind Concrete to address trip hazards	LS	1	$5,000.00	$5,000.00
3	**Geometric Upgrades**				
3.1	New Sidewalk at unfilled desire lines	m^2	38	$100.00	$3,750.00
3.2	Bridge Joint Maintenance	LS	1	$5,000.00	$5,000.00
3.3	Path Widening	m^2	50	$60.00	$3,000.00
4	**Lighting Improvements**				
4.10	New Street Lighting	ea	2	$6,000.00	$12,000.00
	Sub-total				**$33,740.00**
	Contingency	%	30%		$10,122.00
	Engineering	%	15%		$5,061.00
	Total				**$48,923.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 2 - CPR Bridge

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	3	$400.00	$1,200.00
2	**Geometric Upgrades**				
2.1	New Sidewalk at unfilled desire lines	m^2	98	$100.00	$9,750.00
3	**Lighting Improvements**				
3.10	New Pedestrian Lighting	ea	2	$5,000.00	$10,000.00
	Sub-total				**$20,950.00**
	Contingency	%	30%		$6,285.00
	Engineering	%	15%		$3,142.50
	Total				**$30,377.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Costs not included for bridge upgradeshort as the bridge is owned by CP Rail.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 3 - University Bridge

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
1.2	Pavement Markings	LS	1	$900.00	$900.00
2	**Geometric Upgrades**				
3.1	New Sidewalk at unfilled desire lines	m^2	420	$100.00	$42,000.00
3.3	Bumpouts	ea	120	$150.00	$18,000.00
3.4	Raised Crosswalk	L.S.	1	$20,000.00	$20,000.00
3.4	Path Widening	m^2	105	$60.00	$6,300.00
4	**Lighting Improvements**				
4.10	New Pedestrian Lighting	ea	2	$6,000.00	$12,000.00
4.11	Pedestrian Push Button	ea	1	$5,000.00	$5,000.00
	Sub-total				**$105,000.00**
	Contingency	%	30%		$31,500.00
	Engineering	%	15%		$15,750.00
	Total				**$152,250.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost for raised crosswalk assumes minimal drainage requirements.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 4 - Broadway Bridge

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	1	$400.00	$400.00
1.2	Pavement Markings	LS	1	$300.00	$300.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	15	$115.00	$1,725.00
3	**Geometric Upgrades**				
3.1	Remove curb ramp and replace with sidewalk	m^2	5	$150.00	$750.00
3.2	Bike Ramps	ea	2	$2,500.00	$5,000.00
3.3	Path Widening	m^2	75	$60.00	$4,500.00
3.4	Fence	m	50	$60.00	$3,000.00
	Sub-total				**$15,675.00**
	Contingency	%	30%		$4,702.50
	Engineering	%	15%		$2,351.25
	Total				**$22,728.75**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to widen bridge to accommodate 3 m path not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 5 - Traffic Bridge

Item	Description	Recomm	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**	1,8				
1.1	Pavement Markings		LS	1	$300.00	$300.00
2	**Geometric Upgrades**					
2.1	New Sidewalk at unfilled desire lines		m^2	195	$100.00	$19,500.00
2.2	Remove curb ramp and replace with sidewalk		m^2	10	$150.00	$1,500.00
2.3	Seeding		L.S.	1	$200.00	$200.00
	Sub-total					**$21,500.00**
	Contingency		%	30%		$6,450.00
	Engineering		%	15%		$3,225.00
	Total					**$31,175.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maimtenance items such as cleanup of construction debris and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 6 - Sid Buckwold Bridge

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	5	$400.00	$2,000.00
3	**Geometric Upgrades**				
3.1	New Sidewalk at unfilled desire lines	m^2	210	$100.00	$21,000.00
3.2	Bike Ramps	ea	2	$2,500.00	$5,000.00
3.3	Curb extension	m^2	30	$150.00	$4,500.00
4	**Lighting Improvements**				
4.10	New Pedestrian Lighting	ea	4	$5,000.00	$20,000.00
	Sub-total				**$52,500.00**
	Contingency	%	30%		$15,750.00
	Engineering	%	15%		$7,875.00
	Total				**$76,125.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as replacing burnt out lights.

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Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 7 - Gordie Howe Bridge

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
1.2	Pavement Markings	LS	1	$200.00	$200.00
1.3	Install Tactile Pannel	ea	2	$500.00	$1,000.00
2	**Geometric Upgrades**				
2.1	Fencing	m	20	$100.00	$2,000.00
3	**Lighting Improvements**				
3.10	New Pedestrian Lighting	ea	4	$5,000.00	$20,000.00
	Sub-total				**$26,400.00**
	Contingency	%	30%		$7,920.00
	Engineering	%	15%		$3,960.00
	Total				**$38,280.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Costs of bio engineering not included as the costs are highly variable depending on how it is done.

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Client: City of Saskatoon
Project: Bridge Shared Use Path Audit
Project# 2019-4316
Date 20-Mar-20
Subject: Opinion of Probable Cost
By: Jon Medori
Reviewed By:

Site 8 - Circle Drive East & Idylwyld Drive N

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	4	$400.00	$1,600.00
1.2	Pavement Markings	LS	1	$340.00	$340.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	30	$115.00	$3,450.00
2.2	Slabjack Sidewalk	m^2	80	$30.00	$2,400.00
3	**Geometric Upgrades**				
3.1	New Sidewalk	m^2	25	$100.00	$2,500.00
3.2	Remove median	m^2	10	$40.00	$400.00
3.3	New Pavement	m^2	10	$75.00	$750.00
3.4	Decommission Light Pole	ea	1	$250.00	$250.00
3.5	Curb Ramps	ea	7	$2,500.00	$17,500.00
3.6	Relocate Hydrant	ea	1	$5,000.00	$5,000.00
3.7	Relocate Ped Push Button	ea	1	$1,000.00	$1,000.00
	Sub-total				**$35,190.00**
	Contingency	%	30%		$10,557.00
	Engineering	%	15%		$5,278.50
	Total				**$51,025.50**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as vegetation maintenance.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client: City of Saskatoon
Project: Bridge Shared Use Path Audit
Project# 2019-4316
Date 20-Mar-20
Subject: Opinion of Probable Cost
By: Jon Medori
Reviewed By:

Site 9 - Circle Drive & Warman Road

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
1.2	Pavement Markings	LS	1	$1,100.00	$1,100.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	20	$115.00	$2,242.50
3	**Geometric Upgrades**				
3.1	Remove Path	m^2	58	$30.00	$1,740.00
3.2	New Path	m^2	135	$60.00	$8,100.00
3.3	New Island	m^2	88	$100.00	$8,800.00
3.4	New Ramp	ea	3	$2,500.00	$7,500.00
3.5	Relocate Pedestal	ea	1	$2,500.00	$2,500.00
3.6	Replace handrail	ea	10	$150.00	$1,500.00
3.7	Path Widening	m^2	75	$60.00	$4,500.00
3.8	New barrier	m	190	$150.00	$28,500.00
5	**Lighting Improvements**				
5.1	New Pedestrian Lighting	ea	5	$5,000.00	$25,000.00
	Sub-total				**$92,282.50**
	Contingency	%	30%		$27,684.75
	Engineering	%	15%		$13,842.38
	Total				**$133,809.63**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as debris cleanup.

3 - Installation of barrier may require bridge widening. Cost of bridge widening not included.

4 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 10 - Circle Drive & 108th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	4	$400.00	$1,600.00
1.2	Pavement Markings	LS	1	$2,300.00	$2,300.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	20	$130.00	$2,535.00
3	**Geometric Upgrades**				
3.1	Remove Sidewalk	m^2	300	$30.00	$9,000.00
3.1	Embankment widening	m^3	860	$15.00	$12,900.00
3.1	New Sidewalk	m^2	405	$100.00	$40,500.00
3.2	Remove Asphalt	m^2	25	$30.00	$750.00
3.2	Remove Island	m^2	85	$60.00	$5,100.00
3.2	New Island	m^2	87	$120.00	$10,440.00
3.2	New Asphalt	m^2	60	$75.00	$4,500.00
3.2	New Ramp	ea	5	$2,500.00	$12,500.00
3.4	Path Widening	m^2	45	$60.00	$2,700.00
4	**Lighting Improvements**				
4.10	New Pedestrian Lighting	ea	3	$5,000.00	$15,000.00
	Sub-total				**$119,825.00**
	Contingency	%	30%		$35,947.50
	Engineering	%	15%		$17,973.75
	Total				**$173,746.25**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Separate walk may require additional ROW. Property costs are not included.

4 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 11 - Circle Drive & 14th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Relocate Sign	ea	1	$400.00	$400.00
1.2	Pavement Markings	LS	1	$1,240.00	$1,240.00
2	**Geometric Upgrades**				
2.1	Remove Path	m^2	70	$30.00	$2,100.00
2.2	New Path	m^2	53	$60.00	$3,180.00
2.3	Relocate Catch Basin	ea	1	$2,500.00	$2,500.00
2.4	Sidewalk widening	m^2	15	$100.00	$1,500.00
2.5	Remove Island	m^2	50	$100.00	$5,000.00
2.6	New Island	m^2	80	$100.00	$8,000.00
2.7	New Asphalt	m^2	115	$75.00	$8,625.00
2.8	Remove curb ramp	ea	1	$500.00	$500.00
2.9	New Ramp	ea	6	$2,500.00	$15,000.00
2.9	New Fence	ea	15	$100.00	$1,500.00
	Sub-total				**$49,545.00**
	Contingency	%	30%		$14,863.50
	Engineering	%	15%		$7,431.75
	Total				**$71,840.25**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as debris clean up, vegetation maintainance and light rep

3 - Separate walk requires additional ROW. Property costs are not included.

4 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 12 - Circle Drive & 8th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	12	$400.00	$4,800.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	30	$130.00	$3,900.00
3	**Geometric Upgrades**				
3.1	Remove Sidewalk	m^2	450	$30.00	$13,500.00
3.2	New Sidewalk	m^2	450	$100.00	$45,000.00
3.3	Remove Island	m^2	30	$60.00	$1,800.00
3.4	New Asphalt	m^2	30	$75.00	$2,250.00
3.5	New Ramp	ea	5	$2,500.00	$12,500.00
3.6	New Barrier	m	200	$150.00	$30,000.00
3.7	New Driveway Aprons	m^2	149	$130.00	$19,305.00
4	**Lighting Improvements**				
4.10	New Pedestrian Lighting	ea	4	$5,000.00	$20,000.00
	Sub-total				**$153,055.00**
	Contingency	%	30%		$45,916.50
	Engineering	%	15%		$22,958.25
	Total				**$221,929.75**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Separate walk may require additional ROW. Property costs are not included.

4 - Cost to replace conventional corner islands with high entry angle islands not included.

5 - Access consolidation costs not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client: City of Saskatoon
Project: Bridge Shared Use Path Audit
Project# 2019-4316
Date 20-Mar-20
Subject: Opinion of Probable Cost
By: Jon Medori
Reviewed By:

Site 13 - Circle Drive & Taylor Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	10	$400.00	$4,000.00
1.2	Pavement Markings	LS	1	$1,280.00	$1,280.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	280	$130.00	$36,400.00
3	**Geometric Upgrades**				
3.7	New Ramp	ea	5	$2,500.00	$12,500.00
3.11	Sidewalk Widening	m^2	1,110	$100.00	$111,000.00
4	**Lighting Improvements**				
4.1	Realign Pedestrian Push Button	ea	4	$2,500.00	$10,000.00
4.2	New Pedestrian Lighting	ea	1	$5,000.00	$5,000.00
	Sub-total				**$180,180.00**
	Contingency	%	30%		$54,054.00
	Engineering	%	15%		$27,027.00
	Total				**$261,261.00**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**
2 - Costs not provided for general maintenance items such as graffiti cleanup and debris removal.
3 - Cost of wider sidewalk over bridge not included.
4 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Associated Engineering

Site 14 - Circle Drive & Preston Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	9	$400.00	$3,600.00
1.2	Pavement Markings	LS	1	$920.00	$920.00
2	**Geometric Upgrades**				
3.2	New Ramp	ea	4	$2,500.00	$10,000.00
3.4	Remove barrier curb	m	10	$40.00	$400.00
3.4	New Barrier Curb	m	8	$100.00	$800.00
4	**Lighting Improvements**				
4.1	New Pedestrian Lighting	ea	1	$5,000.00	$5,000.00
	Sub-total				**$20,720.00**
	Contingency	%	30%		$6,216.00
	Engineering	%	15%		$3,108.00
	Total				**$30,044.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 15 - Circle Drive & Clarence Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
1.2	Pavement Markings	LS	1	$1,140.00	$1,140.00
2	**Geometric Upgrades**				
2.1	New Ramp	ea	2	$2,500.00	$5,000.00
2.2	Remove barrier curb	m	15	$40.00	$600.00
2.3	New Barrier Curb	m	12	$100.00	$1,200.00
	Sub-total				**$11,140.00**
	Contingency	%	30%		$3,342.00
	Engineering	%	15%		$1,671.00
	Total				**$16,153.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 15

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 16 - Circle Drive & Lorne Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	10	$400.00	$4,000.00
1.2	Pavement Markings	LS	1	$2,460.00	$2,460.00
2	**Geometric Upgrades**				
2.1	Remove Metal Post	ea	1	$500.00	$500.00
2.2	Realign Pedestrian Recall Button	m	1	$500.00	$500.00
	Sub-total				**$7,460.00**
	Contingency	%	30%		$2,238.00
	Engineering	%	15%		$1,119.00
	Total				**$10,817.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 17 - Circle Drive & 11th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
1.2	Pavement Markings	LS	1	$1,580.00	$1,580.00
3	**Geometric Upgrades**				
3.4	Remove Curb and Gutter Crossing	m	10	$40.00	$400.00
3.4	New Curb and Gutter	m	10	$100.00	$1,000.00
4	**Lighting Improvements**				
4.10	New Pedestrian Lighting	ea	1	$5,000.00	$5,000.00
	Sub-total				**$11,180.00**
	Contingency	%	30%		$3,354.00
	Engineering	%	15%		$1,677.00
	Total				**$16,211.00**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost of intersection upgrades including replacement of conventional corner islands with high entry angle islands

4 - Cost of rail crossing upgrades not included.

5 - Cost of access consolidation not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 18 - Circle Drive & 22nd Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	12	$400.00	$4,800.00
1.2	Pavement Markings	LS	1	$880.00	$880.00
1.3	Remove sign base	ea	1	$100.00	$100.00
2	**Maintenance**				
2.1	Path Repair	m^2	150	$90.00	$13,500.00
3	**Geometric Upgrades**				
3.1	Path Widening	m^2	30	$60.00	$1,800.00
	Sub-total				**$21,080.00**
	Contingency	%	30%		$6,324.00
	Engineering	%	15%		$3,162.00
	Total				**$30,566.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 19 - Circle Drive & 33rd Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
2	**Geometric Upgrades**				
2.1	Remove Sidewalk	m^2	405	$30.00	$12,150.00
2.2	New Sidewalk	m^2	473	$100.00	$47,250.00
2.3	New Island	m^2	35	$80.00	$2,800.00
2.4	New Asphalt	m^2	50	$75.00	$3,750.00
2.5	New Ramp	ea	6	$2,500.00	$15,000.00
3	**Lighting Improvements**				
3.1	Realign Ped Recall Button	ea	4	$500.00	$2,000.00
3.2	Relocate Light	ea	3	$3,000.00	$9,000.00
	Sub-total				**$92,750.00**
	Contingency	%	30%		$27,825.00
	Engineering	%	15%		$13,912.50
	Total				**$134,487.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 20 - Idylwyld Drive & Lorne Avenue/Ruth Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Pavement Markings	L.S.	1	$2,080.00	$2,080.00
2	**Geometric Upgrades**				
2.1	Remove Sidewalk	m^2	74	$30.00	$2,227.50
2.2	New Sidewalk	m^2	62	$100.00	$6,225.00
2.3	New Ramp	ea	4	$2,500.00	$10,000.00
2.4	New Driveway Aprons	m^2	20	$130.00	$2,600.00
3	**Lighting Improvements**				
3.1	Realign Ped Recall Button	ea	6	$500.00	$3,000.00
3.2	Relocate Light	ea	5	$3,000.00	$15,000.00
4	**Utility Costs**				
4.1	Relocate utility box	ea	1	$2,500.00	$2,500.00
	Sub-total				**$43,632.50**
	Contingency	%	30%		$13,089.75
	Engineering	%	15%		$6,544.88
	Total				**$63,267.13**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, replacing lights and tree trimming.

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Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 21 - Idylwyld Drive & Taylor Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
1.2	Pavement Markings	L.S.	1	$640.00	$640.00
2	**Geometric Upgrades**				
3.2	Remove Asphalt	m^2	50	$30.00	$1,500.00
3.2	New Bollards	ea	3	$250.00	$750.00
3.2	New Island	m^2	25	$80.00	$2,000.00
3.2	New Ramp	ea	1	$2,500.00	$2,500.00
3.4	New Driveway Aprons	m^2	24	$130.00	$3,120.00
	Sub-total				**$11,310.00**
	Contingency	%	30%		$3,393.00
	Engineering	%	15%		$1,696.50
	Total				**$16,399.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, replacing lights and tree trimming.

3 - Separate walk requires additional ROW. Property costs are not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 22 - Idylwyld Drive & 8th Street/Lorne Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
1.2	Pavement Markings	L.S.	1	$1,000.00	$1,000.00
2	**Geometric Upgrades**				
2.1	Remove Stairs	L.S.	1	$1,000.00	$1,000.00
2.2	New Path	m^2	255	$60.00	$15,300.00
2.3	Path Widening	m^2	125	$60.00	$7,500.00
2.4	Remove Sidewalk	m^2	15	$30.00	$450.00
2.5	New Sidewalk	m^2	38	$100.00	$3,750.00
2.6	Remove Asphalt	m^2	50	$30.00	$1,500.00
2.7	New Curb	m^2	15	$80.00	$1,200.00
2.8	New Ramp	ea	8	$2,500.00	$20,000.00
4	**Lighting Improvements**				
4.1	Realign Ped Recall Button	ea	1	$500.00	$500.00
	Sub-total				**$53,000.00**
	Contingency	%	30%		$15,900.00
	Engineering	%	15%		$7,950.00
	Total				**$76,850.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, replacing lights and tree trimming.

3 - Cost to recalibrate or install cyclist detection not included..

4 - Cost to reduce curb radius not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 23 - McKercher Drive & College Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	3	$400.00	$1,200.00
1.2	Pavement Markings	L.S.	1	$280.00	$280.00
2	**Geometric Upgrades**				
2.1	New Curb and Gutter	m	200	$120.00	$24,000.00
2.2	New Sidewalk	m^2	10	$100.00	$1,000.00
3	**Lighting Improvements**				
3.1	Relocate Light	ea	3	$3,000.00	$9,000.00
3.2	Realign Ped Recall Button	ea	2	$500.00	$1,000.00
4	**Utility Costs**				
4.1	Relocate utility box	ea	1	$2,500.00	$2,500.00
	Sub-total				**$38,980.00**
	Contingency	%	30%		$11,694.00
	Engineering	%	15%		$5,847.00
	Total				**$56,521.00**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Costs to widen path over bridge are not included.

4 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 24 - Clarence Avenue S. - Railway

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
2	**Geometric Upgrades**				
2.1	New Sidewalk	m^2	68	$100.00	$6,750.00
2.2	Safety Rail	m	120	$100.00	$12,000.00
2.3	Asphalt shim	m^2	5	$100.00	$500.00
2.4	New Ramp	ea	2	$2,500.00	$5,000.00
3	**Lighting Improvements**				
3.1	Realign Ped Recall Button	ea	3	$500.00	$1,500.00
	Sub-total				**$26,550.00**
	Contingency	%	30%		$7,965.00
	Engineering	%	15%		$3,982.50
	Total				**$38,497.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, replacing lights and tree trimming.

3 - Cost to replace conventional corner islands with high entry angle islands not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 25 - College Drive & Central Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	5	$400.00	$2,000.00
1.2	Pavement Markings	L.S.	1	$240.00	$240.00
2	**Geometric Upgrades**				
2.1	New Sidewalk	m^2	90	$100.00	$9,000.00
2.2	New Ramp	ea	5	$2,500.00	$12,500.00
3	**Lighting Improvements**				
3.1	RRFB	ea	2	$10,000.00	$20,000.00
3.2	Realign Ped Recall Button	ea	3	$500.00	$1,500.00
	Sub-total				**$45,240.00**
	Contingency	%	30%		$13,572.00
	Engineering	%	15%		$6,786.00
	Total				**$65,598.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, fence repair and replacing lights.

3 - Cost of intersection upgrades not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 26 - 22nd Street W. by Circle Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	2	$400.00	$800.00
2	**Lighting Improvements**				
2.1	New Pedestrian Lighting	ea	4	$5,000.00	$20,000.00
	Sub-total				**$20,800.00**
	Contingency	%	30%		$6,240.00
	Engineering	%	15%		$3,120.00
	Total				**$30,160.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 27 - 22nd Street W. by Shaw Centre

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
1.2	Pavement Markings	L.S.	1	$280.00	$280.00
2	**Geometric Upgrades**				
2.1	Remove Curb and Gutter Crossing	m	10	$30.00	$300.00
2.2	New Curb and Gutter Crossing	m^2	20	$130.00	$2,600.00
2.3	New Sidewalk	m^2	30	$100.00	$3,000.00
3	**Lighting Improvements**				
3.1	New Lighting	ea	1	$5,000.00	$5,000.00
	Sub-total				**$14,380.00**
	Contingency	%	30%		$4,314.00
	Engineering	%	15%		$2,157.00
	Total				**$20,851.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 28 - Idylwyld Drive by St. Patrick Avenue/Hilliard Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
1.2	Pavement Markings	L.S.	1	$480.00	$480.00
2	**Geometric Upgrades**				
2.1	New Sidewalk	m^2	45	$100.00	$4,500.00
2.2	Safety Rail	m	20	$100.00	$2,000.00
2.3	Remove Bollards	ea	4	$100.00	$400.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	1	$5,000.00	$5,000.00
	Sub-total				**$15,580.00**
	Contingency	%	30%		$4,674.00
	Engineering	%	15%		$2,337.00
	Total				**$22,591.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup, fence repair and tree trimming.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 29 - Idylwyld Drive N. by 45th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	4	$400.00	$1,600.00
2	**Geometric Upgrades**				
2.1	New Ramp	ea	2	$2,500.00	$5,000.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	4	$5,000.00	$20,000.00
	Sub-total				**$26,600.00**
	Contingency	%	30%		$7,980.00
	Engineering	%	15%		$3,990.00
	Total				**$38,570.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Short term costs shown above. For cost of ramps included in separate cost estimate accompanied by conceptual

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 30 - University Drive and College Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Geometric Upgrades**				
1.1	Remove Curb Ramp	ea	1	$500.00	$500.00
1.2	New Fence	m	20	$60.00	$1,200.00
1.3	New Path	m^2	60	$60.00	$3,600.00
1.4	Remove ramp	ea	1	$600.00	$600.00
1.5	New Ramp	ea	2	$2,500.00	$5,000.00
	Sub-total				**$10,900.00**
	Contingency	%	30%		$3,270.00
	Engineering	%	15%		$1,635.00
	Total				**$15,805.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as light replacement, graffiti cleanup and tree trimming.

3 - Costs to reduce path slope, increase radius and widen bridge not included.

4 - Short term costs shown above. For cost of ramps included in separate cost estimate accompanied by conceptual

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 31 - Circle Drive & Pembina Place Rupert Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	10	$400.00	$4,000.00
2	**Maintenance**				
2.1	Bridge Deck Transition Repairs	L.S.	1	$5,000.00	$5,000.00
3	**Geometric Upgrades**				
3.1	Widen Path	m^2	60	$60.00	$3,600.00
3.2	New Path	m^2	525	$60.00	$31,500.00
3.3	New Ramp	ea	2	$2,500.00	$5,000.00
3.4	Grading	L.S.	1	$1,000.00	$1,000.00
3.5	Landscaping	L.S.	1	$500.00	$500.00
4	**Lighting Improvements**				
4.1	New Pedestrian Lighting	ea	3	$5,000.00	$13,333.33
	Sub-total				**$63,933.33**
	Contingency	%	30%		$19,180.00
	Engineering	%	15%		$9,590.00
	Total				**$92,703.33**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to replace sound wall with transparent panes not included.

4 - Cost to regrade and landscape not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 32 - Circle Drive & Adolph Crescent/Preston Crossing

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	12	$400.00	$4,800.00
2	**Maintenance**				
2.1	Sidewalk Repair	m^2	253	$130.00	$32,933.33
3	**Geometric Upgrades**				
3.1	Reconfigure fence	m	20	$120.00	$2,400.00
3.2	Remove Bollards	ea	4	$100.00	$400.00
3.3	New Path	m^2	690	$60.00	$41,400.00
3.4	New Ramp	ea	1	$2,500.00	$2,500.00
4	**Lighting Improvements**				
4.1	New Pedestrian Lighting	ea	16	$5,000.00	$81,666.67
	Sub-total				**$166,100.00**
	Contingency	%	30%		$49,830.00
	Engineering	%	15%		$24,915.00
	Total				**$240,845.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree and grass trimming.

3 - Separate walk requires additional ROW. Property costs are not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 33 - Circle Drive & Rossmo Road/Forestry Farm Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	3	$400.00	$1,200.00
2	**Geometric Upgrades**				
2.1	Widen Asphalt Path	m^2	140	$60.00	$8,400.00
2.2	Remove Bollards	ea	4	$150.00	$600.00
2.3	Replace Catchbasin Grates	ea	2	$250.00	$500.00
2.4	Widen Sidewalk	m^2	80	$100.00	$8,000.00
2.5	New Path	m^2	10	$60.00	$600.00
2.6	Remove Ramp	ea	1	$600.00	$600.00
2.7	New Sidewalk	m^2	10	$100.00	$1,000.00
2.8	Remove Stairs	L.S.	1	$5,000.00	$5,000.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	6	$2,500.00	$15,000.00
	Sub-total				**$40,900.00**
	Contingency	%	30%		$12,270.00
	Engineering	%	15%		$6,135.00
	Total				**$59,305.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to address non-standard underpass not included

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 34 - Circle Drive & Clancy Drive/18th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	6	$400.00	$2,400.00
1.2	Pavement Markings	LS	1	$1,360.00	$1,360.00
2	**Geometric Upgrades**				
2.1	New Fence	m	30	$60.00	$1,800.00
2.2	Remove Sidewalk	m^2	10	$40.00	$400.00
2.3	New Ramp	ea	2	$2,500.00	$5,000.00
	Sub-total				**$10,960.00**
	Contingency	%	30%		$3,288.00
	Engineering	%	15%		$1,644.00
	Total				**$15,892.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as litter and graffiti cleanup, and tree trimming.

3 - Cost to address non-standard underpass not included

4 - Cost to upgrade to high-entry angle slip lane not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 35 - Circle Drive & Vancouver Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Relocate Signs	ea	1	$100.00	$100.00
1.1	Signs	ea	4	$400.00	$1,600.00
2	**Geometric Upgrades**				
2.1	New Fence	m	80	$60.00	$4,800.00
2.2	Remove Asphalt	m^2	140	$30.00	$4,200.00
2.3	Remove Sidewalk	m^2	8	$30.00	$225.00
2.4	New Path	m^2	75	$60.00	$4,500.00
2.5	New Driveway Aprons	m^2	10	$130.00	$1,300.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	6	$2,500.00	$15,000.00
	Sub-total				**$31,625.00**
	Contingency	%	30%		$9,487.50
	Engineering	%	15%		$4,743.75
	Total				**$45,856.25**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as litter and graffiti cleanup, and tree trimming.

3 - Cost to address non-standard underpass not included including flared end treatment.

4 - Cost to address drainage not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 36 - Circle Drive & 29th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Relocate Signs	ea	1	$100.00	$100.00
1.2	Signs	ea	5	$400.00	$2,000.00
2	**Geometric Upgrades**				
2.1	Path Widening	m^2	20	$60.00	$1,200.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	6	$2,500.00	$15,000.00
	Sub-total				**$18,200.00**
	Contingency	%	30%		$5,460.00
	Engineering	%	15%		$2,730.00
	Total				**$26,390.00**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to address non-standard underpass not included

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 37 - Circle Drive & Edmonton Avenue

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	5	$400.00	$2,000.00
2	**Geometric Upgrades**				
2.1	Remove Asphalt Path	m^2	100	$30.00	$3,000.00
2.2	New Asphalt Path	m^2	150	$60.00	$9,000.00
2.3	Remove Sidewalk	m^2	75	$30.00	$2,250.00
2.4	New Sidewalk	m^2	75	$100.00	$7,500.00
2.5	New Ramp	ea	3	$2,500.00	$7,500.00
2.6	New curb	m	50	$150.00	$7,500.00
3	**Lighting Improvements**				
3.10	New Pedestrian Lighting	ea	7	$2,500.00	$17,500.00
	Sub-total				**$56,250.00**
	Contingency	%	30%		$16,875.00
	Engineering	%	15%		$8,437.50
	Total				**$81,562.50**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to address non-standard underpass not included

4 - Cost to upgrade rail crossing not included.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 38 - Idylwyld Drive & 11th Street

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	6	$400.00	$2,400.00
2	**Geometric Upgrades**				
2.1	Remove Path	m^2	30	$30.00	$900.00
2.2	New Ramp	ea	7	$2,500.00	$17,500.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	6	$2,500.00	$15,000.00
3.2	New polished aluminum mirror	ea	2	$250.00	$500.00
	Sub-total				**$36,300.00**
	Contingency	%	30%		$10,890.00
	Engineering	%	15%		$5,445.00
	Total				**$52,635.00**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to address non-standard underpass and excessive crossing distance at McPherson Ave and 11 Street not in

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Jon Medori**
Reviewed By:	

Site 39 - Circle Drive & Harrington Crescen/Lindsay Drive

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	8	$400.00	$3,200.00
2	**Geometric Upgrades**				
2.1	Remove Sidewalk	m^2	14	$30.00	$432.00
2.2	Remove and Replace Asphalt	m^2	90	$130.00	$11,700.00
2.3	Curb Ramp	ea	2	$2,500.00	$5,000.00
2.4	Remove Bollards	ea	4	$150.00	$600.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	2	$2,500.00	$5,000.00
	Sub-total				**$25,932.00**
	Contingency	%	30%		$7,779.60
	Engineering	%	15%		$3,889.80
	Total				**$37,601.40**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

3 - Cost to address non-standard underpass not included

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

Client: City of Saskatoon
Project: Bridge Shared Use Path Audit
Project# 2019-4316
Date 20-Mar-20
Subject: Opinion of Probable Cost
By: Jon Medori
Reviewed By:

Site 40 - 33rd Street & 10th Avenue (railway underpass)

Item	Description	Unit	Quantity	Unit Price	Extension
1	**Signage and Pavement Markings**				
1.1	Signs	ea	1	$400.00	$400.00
2	**Geometric Upgrades**				
2.1	New Sidewalk	m^2	150	$100.00	$15,000.00
3	**Lighting Improvements**				
3.1	New Pedestrian Lighting	ea	1	$2,500.00	$2,500.00
3.2	New RRFP at Ped Crossing	ea	2	$10,000.00	$20,000.00
	Sub-total				**$37,900.00**
	Contingency	%	30%		$11,370.00
	Engineering	%	15%		$5,685.00
	Total				**$54,955.00**

Notes: **1 - Cost Estimate in 2020 Dollars and excludes all taxes.**
2 - Costs for recommendation to address non-standard underpass and bury utilities not included.
3 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.
4 - Cost does not include fencing as it would be on railroad property.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Site 40

APPENDIX D - CONCEPTUAL DESIGNS AND COST ESTIMATES

D-1 PEDESTRIAN RAMP CONCEPTUAL DESIGN AND COST ESTIMATE

Based on the recommendations, conceptual ramp layouts have been prepared for both the College Drive and Central Avenue pedestrian crossing as well as the Idylwyld Drive and 45th Street crossing.

The crossing concepts utilize switch back ramps rather than spiral ramps. Spiral ramps were not considered for this exercise as the more complex geometry required to construct the ramps would increase capital construction costs further. Ramp layouts were developed to try and bring the transition point from the bridge structure to existing pedestrian sidewalk along the existing path networks, layouts could be modified to suit specific requirements of the City.

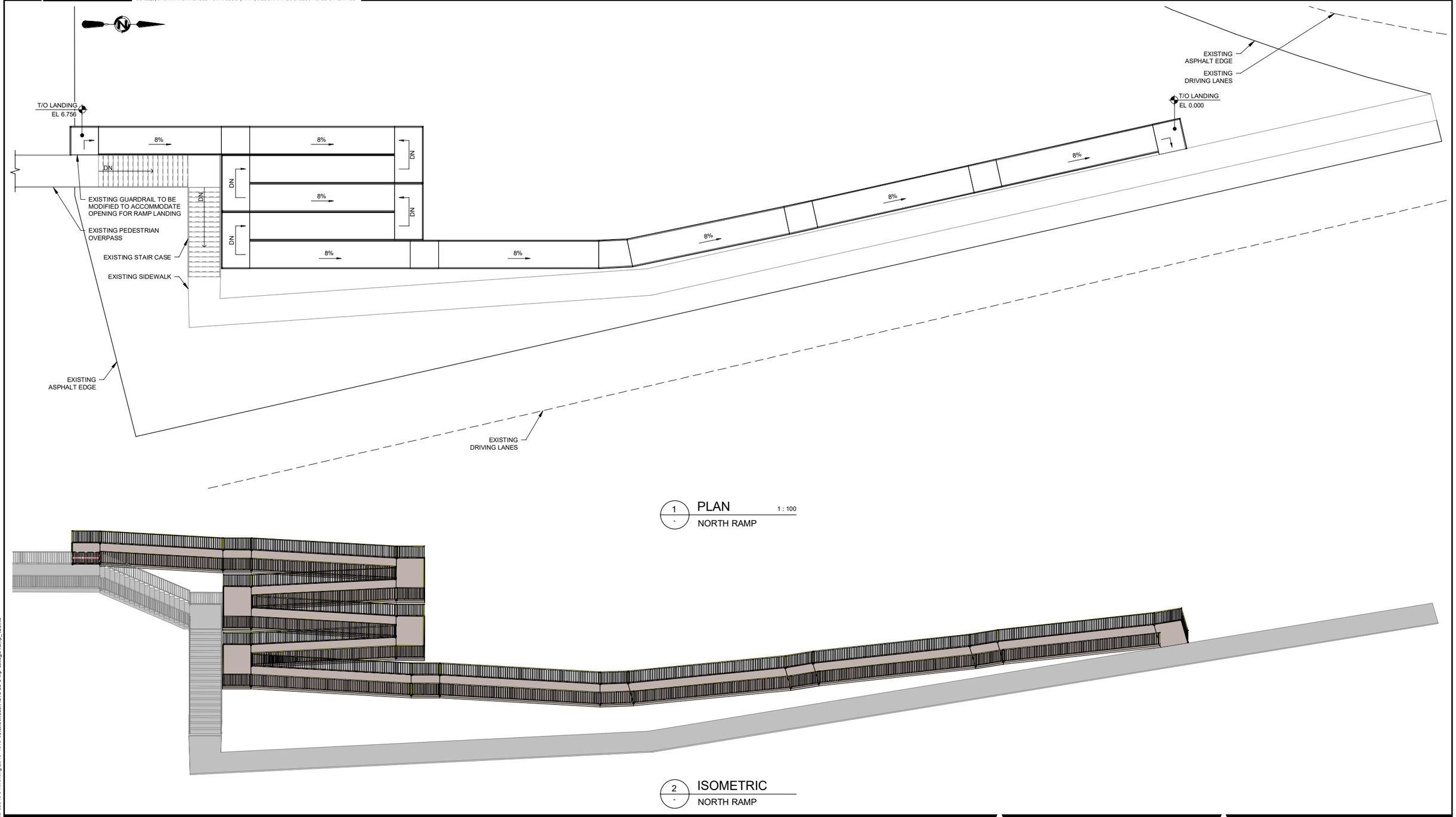
Switchback ramps shown use a maximum grade of 8% in accordance with the Transportation Association of Canada (TAC) – Geometric Design Guide for Canadian Roads (GDG) for a shared use path. Flat landings have been provided every 9.0 m in accordance with TAC and the CSA Canadian Standards Association (CSA) B651-18 – Accessible Design for the Built Environment. The ramps shown have a width of 1.83 m (6'-0") to match the width of the existing structures. Pedestrian/cyclist handrails have been shown however more standard wrap around fencing could also be provided.

Only the ramp layouts have been shown on the drawings for clarity. In terms of structure type for estimating purposes it has been assumed that a single cast-in-place concrete bored pile of similar length to existing would be provided at each landing/transition point, supporting a cast-in-place concrete substructure column and pier cap. The superstructure for the ramps has been assumed to be a prestressed precast concrete single-tee to match existing; however, alternate superstructure types could be explored.

Cost estimates with a Class D level of accuracy are included following the drawings.

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



1 - PLAN 1 : 100
NORTH RAMP

2 - ISOMETRIC
NORTH RAMP

SAVE DATE: 3/20/2020 11:45:30 AM
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Associated Engineering
BEST MANAGED COMPANIES Platinum member
City of Saskatoon

AE PROJECT No.	20194316-00
SCALE	AS SHOWN
APPROVED	J. MEDORI
DATE	2020MAR20
REV	A
DESCRIPTION	ISSUED FOR REPORT

DRAFT

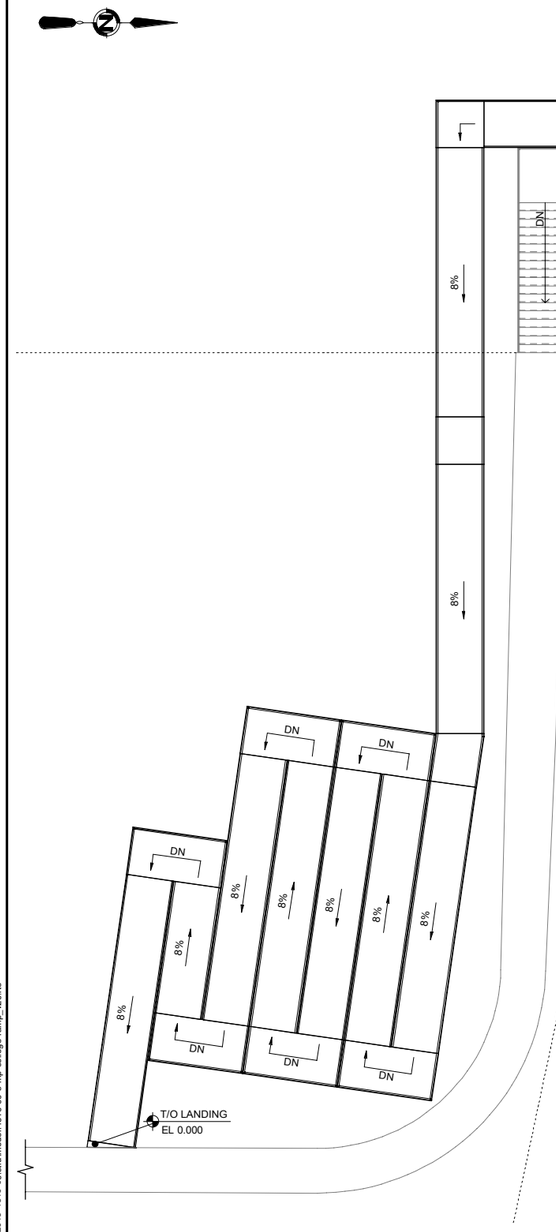
FIGURE No. 1

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

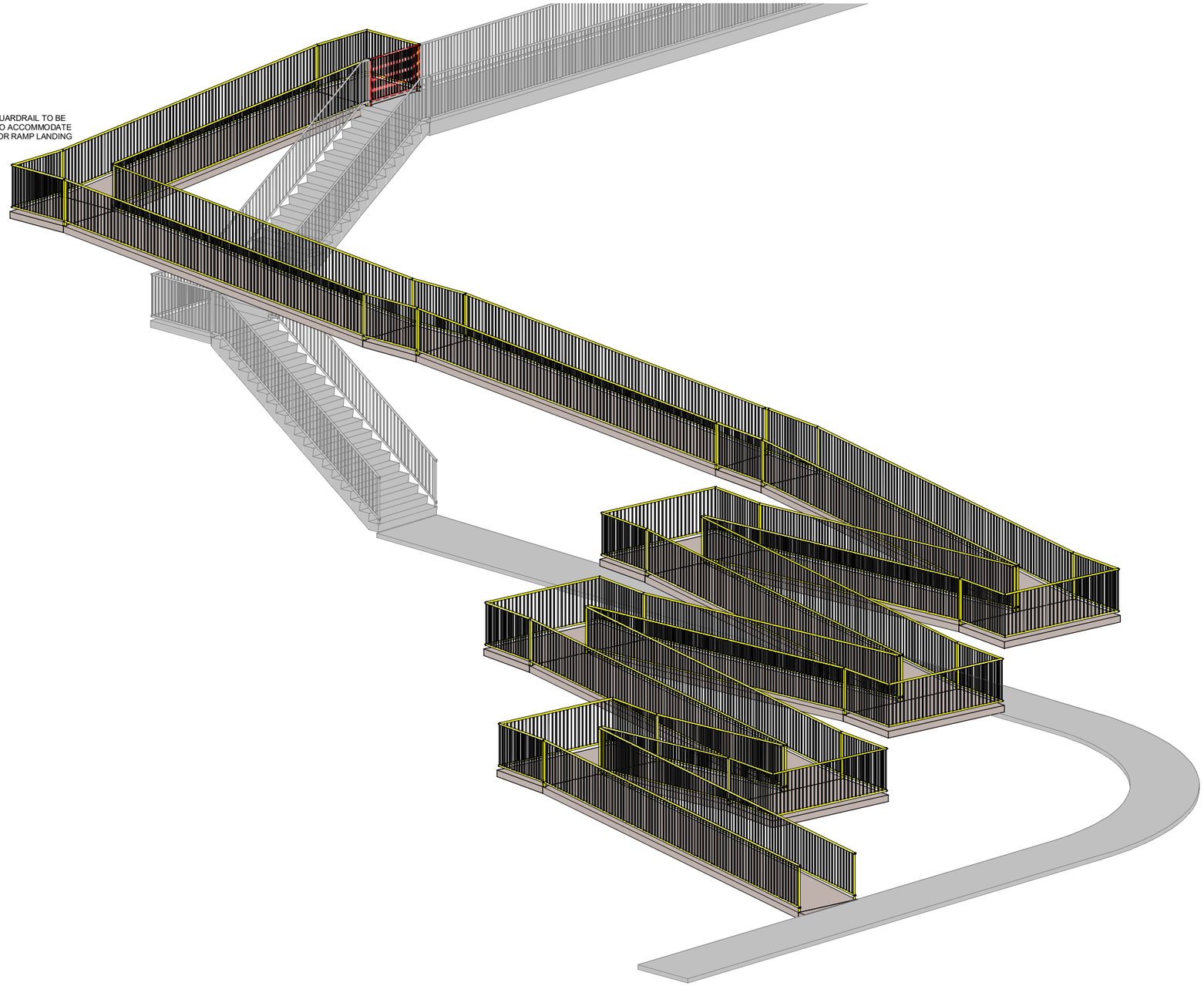
STRUCTURAL
COLLEGE AND CENTRAL OVERPASS
NORTH RAMP

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



1 - PLAN 1 : 100
SOUTH RAMP



2 - ISOMETRIC
SOUTH RAMP

SAVE DATE: 3/20/2020 11:45:37 AM
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Associated Engineering
BEST MANAGED COMPANIES Platinum member
City of Saskatoon

AE PROJECT No.	20194316-00
SCALE	AS SHOWN
APPROVED	J. MEDORI
DATE	2020MAR20
REV	A
DESCRIPTION	ISSUED FOR REPORT

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FIGURE No. 2

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

STRUCTURAL
COLLEGE AND CENTRAL OVERPASS
SOUTH RAMP

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Stephen Chiasson**
Reviewed By:	

Site 25 - College Drive & Central Avenue - Pedestrian Ramps

Item	Description	Unit	Quantity	Unit Price	Extension
1	**College & Central**				
1.1	Mobilization	LS	1	$35,000.00	$35,000.00
1.2	General Requirements	LS	1	$47,000.00	$47,000.00
1.3	Foundations	m	162	$900.00	$145,800.00
1.4	Substructure Concrete	m3	68	$1,500.00	$102,000.00
1.5	Superstructre Concrete	m3	84	$1,800.00	$151,920.00
1.6	Fencing/Railings	m	422	$65.00	$27,430.00
	Sub-total				**$531,650.00**
	Contingency	%	30%		$159,495.00
	Engineering	%	15%		$79,747.50
	Total				**$770,892.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

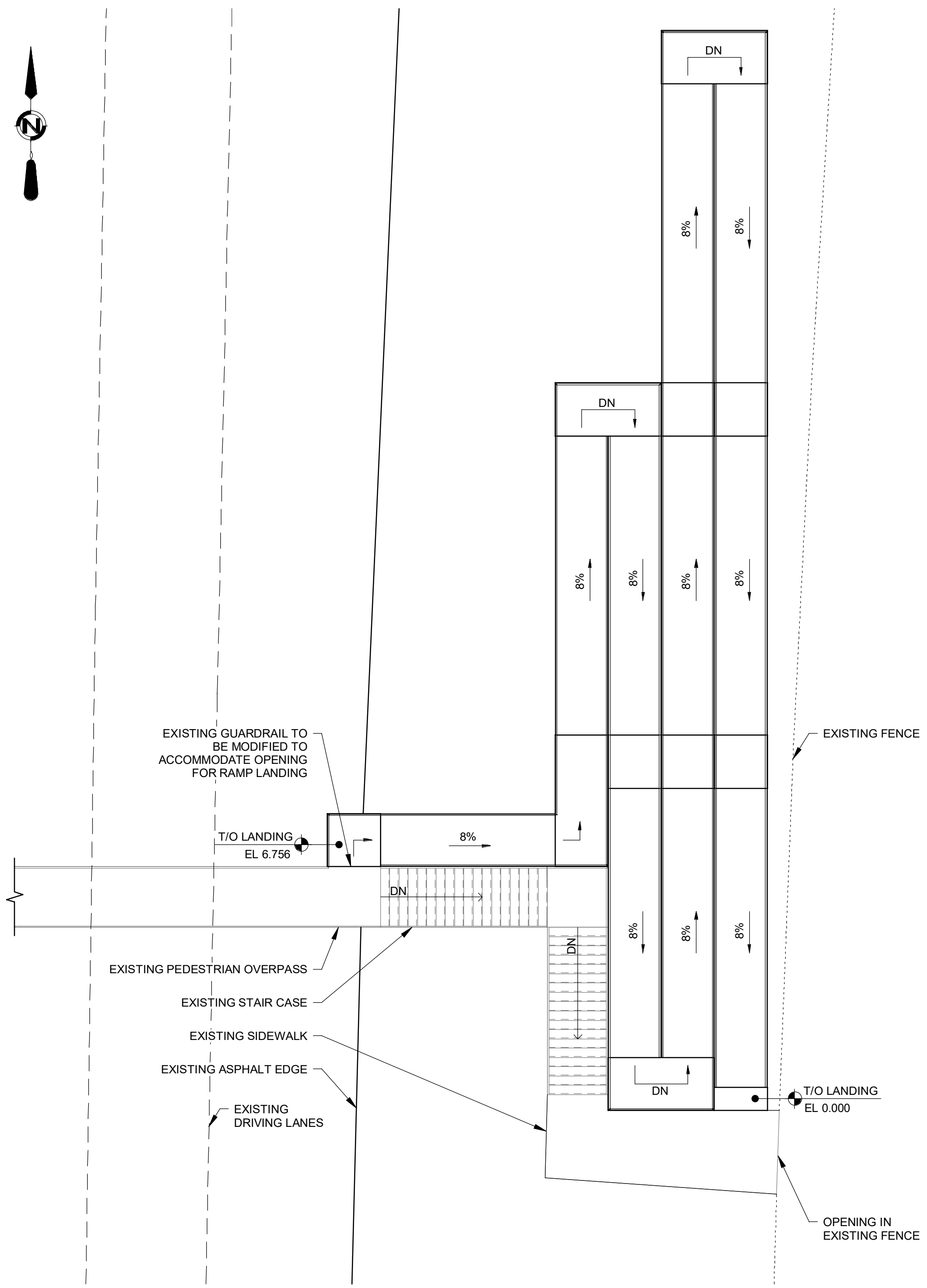
2 - Costs for recommendation to address non-standard underpass and bury utilities not included.

3 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

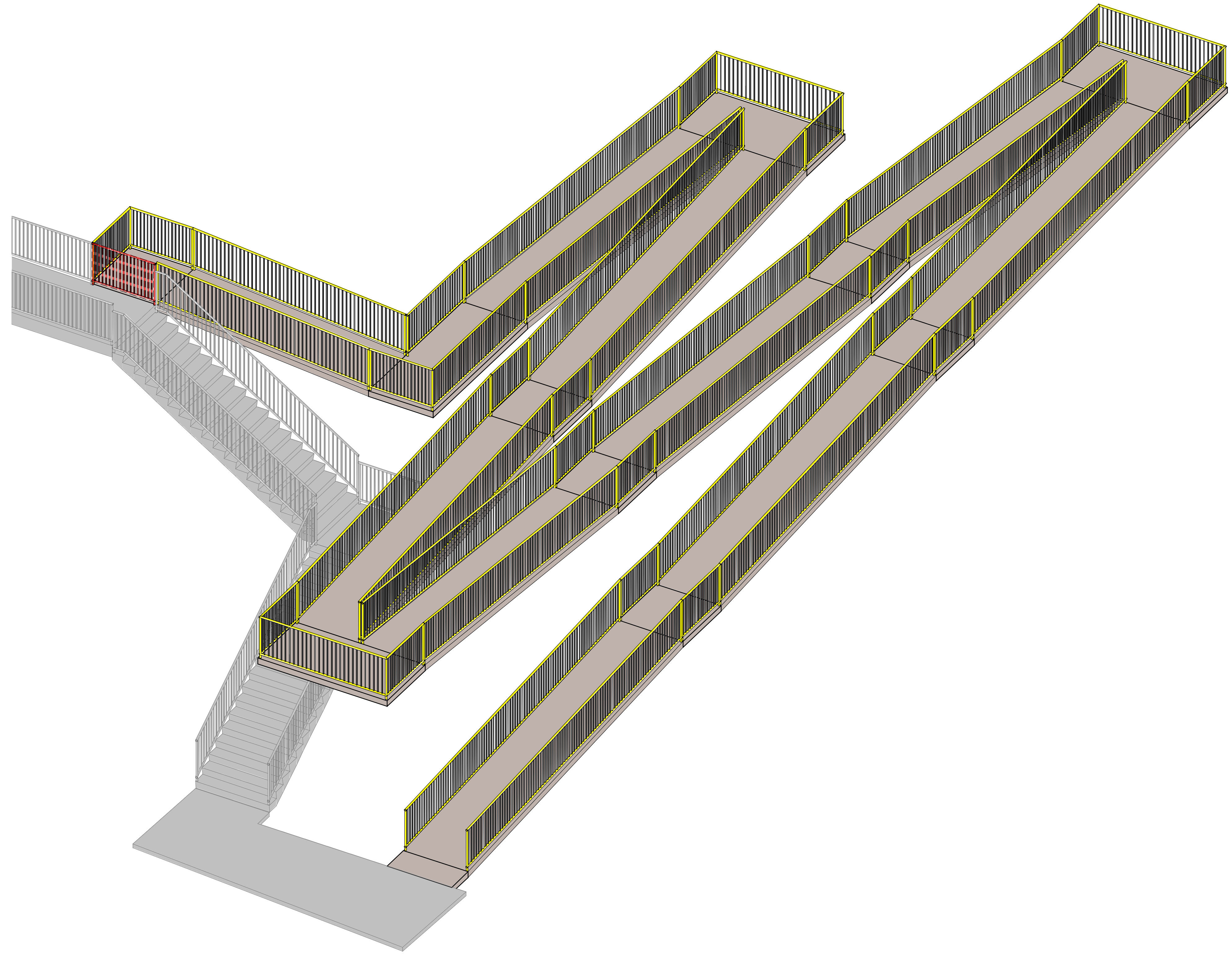
4 - Cost does not include fencing as it would be on railroad property.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Idylwyld @ 45 St.

IF NOT 25 mm ADJUST SCALES
25 mm
SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



1 PLAN 1 : 100
EAST RAMP



2 ISOMETRIC
LOOKING NORTHWEST

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AE PROJECT No.	20194316-00
SCALE	AS SHOWN
APPROVED	J. MEDORI
DATE	2020MAR20
REV	A
DESCRIPTION	ISSUED FOR REPORT

FIGURE No. 3

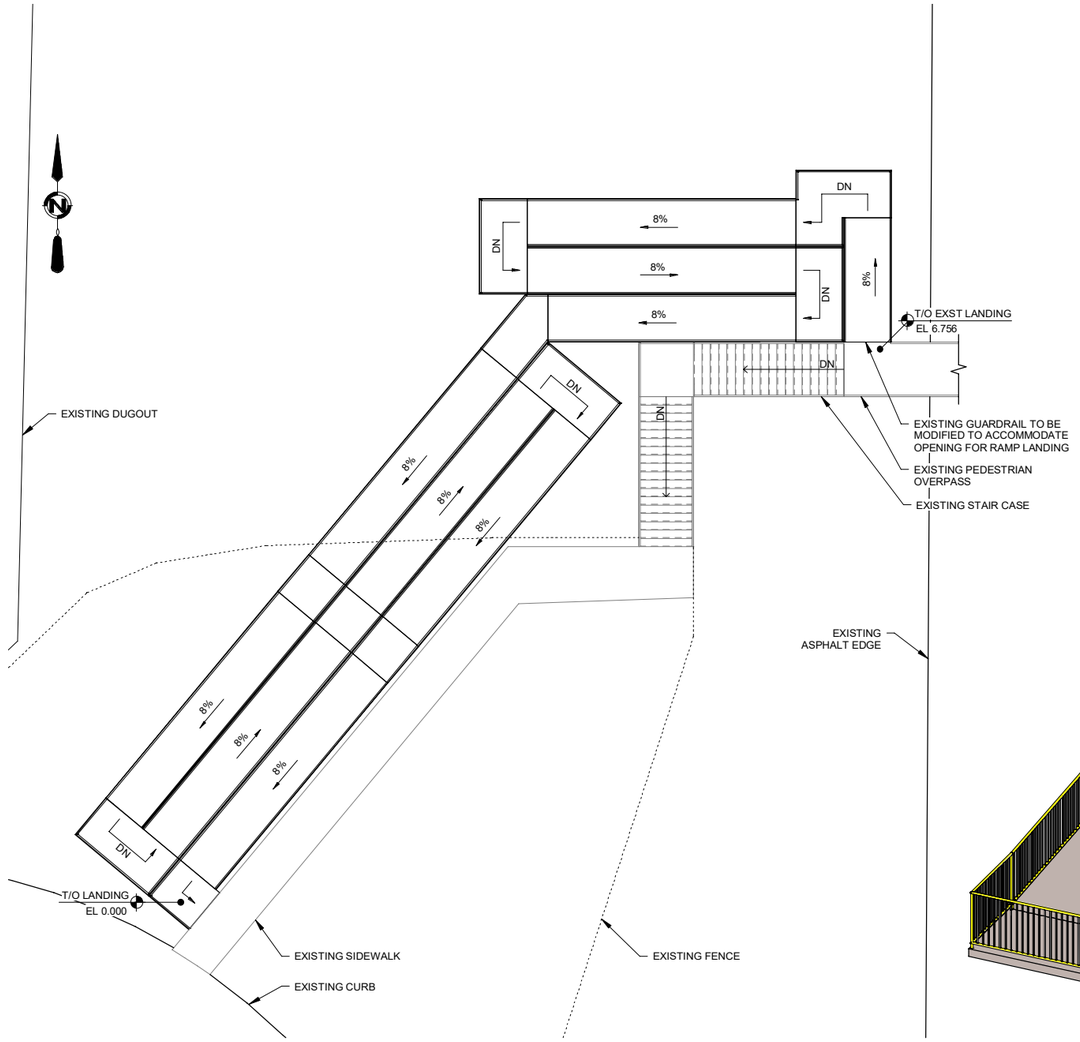
CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

STRUCTURAL
IDYLWYLD AND 45TH STREET OVERPASS
EAST RAMP

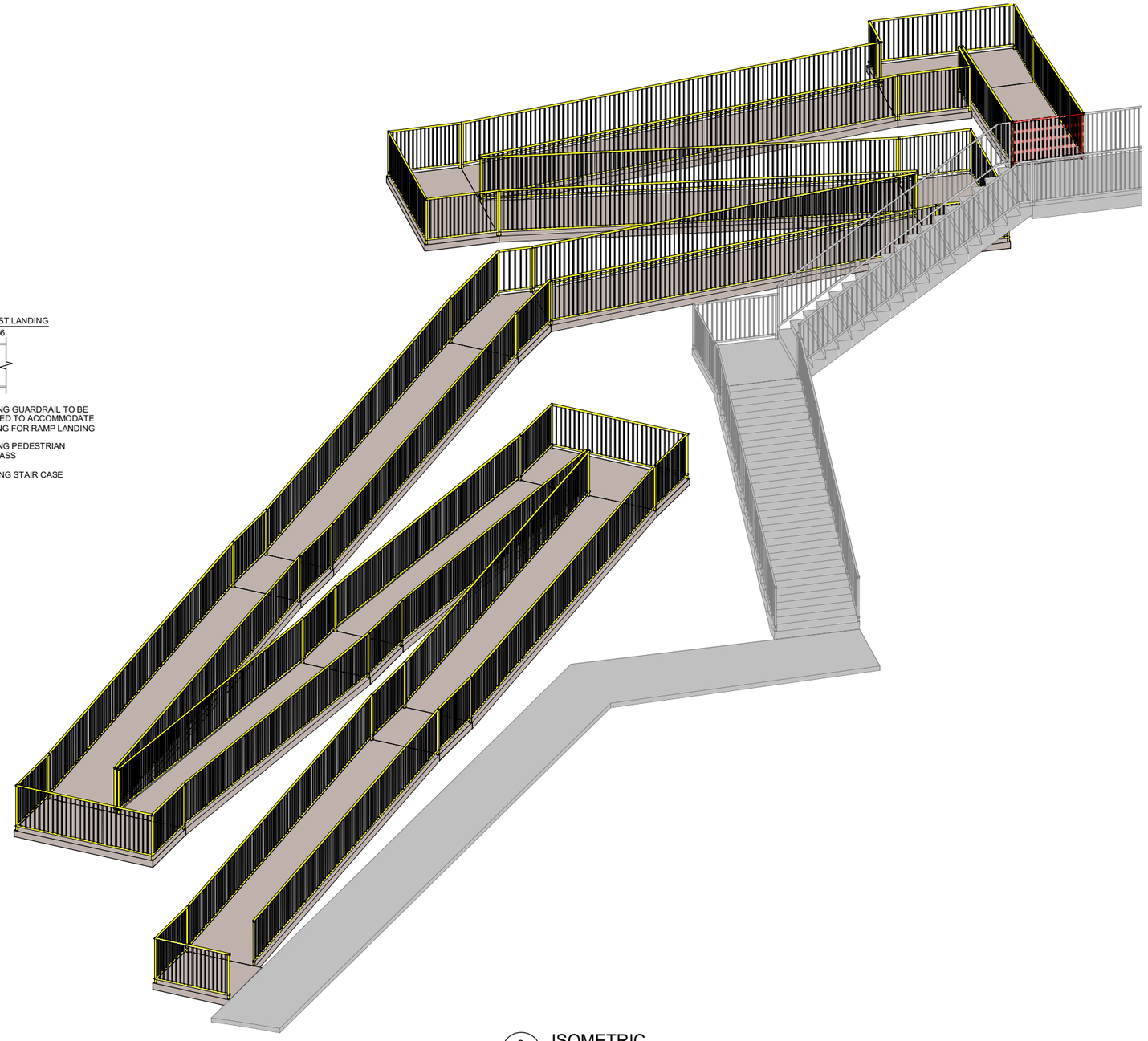
DRAFT

IF NOT 25 mm ADJUST SCALES
25 mm

SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



1 - PLAN 1 : 100
WEST RAMP



2 - ISOMETRIC
WEST RAMP

SAVE DATE: 3/20/2020 11:48:03 AM
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City of Saskatoon

AE PROJECT No.	20194316-00
SCALE	AS SHOWN
APPROVED	J. MEDORI
DATE	2020MAR20
REV	A
DESCRIPTION	ISSUED FOR REPORT

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FIGURE No. 4

CITY OF SASKATOON
BRIDGE SHARED USE PATH AUDIT

STRUCTURAL
IDYLWYLD AND 45TH STREET OVERPASS
WEST RAMP

Client:	**City of Saskatoon**
Project:	**Bridge Shared Use Path Audit**
Project#	**2019-4316**
Date	**20-Mar-20**
Subject:	**Opinion of Probable Cost**
By:	**Stephen Chiasson**
Reviewed By:	

Site 29 - Idylwyld Drive N. by 45th Street - Pedestrian Ramps

Item	Description	Unit	Quantity	Unit Price	Extension
1	**College & Central**				
1.1	Mobilization	LS	1	$35,000.00	$35,000.00
1.2	General Requirements	LS	1	$48,000.00	$48,000.00
1.3	Foundations	m	162	$900.00	$145,800.00
1.4	Substructure Concrete	m3	68	$1,500.00	$102,000.00
1.5	Superstructre Concrete	m3	88	$1,800.00	$157,680.00
1.6	Fencing/Railings	m	438	$65.00	$28,470.00
	Sub-total				**$539,450.00**
	Contingency	%	30%		$161,835.00
	Engineering	%	15%		$80,917.50
	Total				**$782,202.50**

Notes: 1 - Cost Estimate in 2020 Dollars and excludes all taxes.

2 - Costs for recommendation to address non-standard underpass and bury utilities not included.

3 - Costs not provided for general maintenance items such as graffiti cleanup and tree trimming.

4 - Cost does not include fencing as it would be on railroad property.

C:\Users\medorij\Desktop\Bridge Shared Use Path\[est_4316_2020-03-24.xlsx]Idylwyld @ 45 St.