



City of Bethel
Public Works Committee
Regular Meeting - Wednesday, January 15, 2020 5:30 pm City Hall
Council Chambers, Bethel, AK

Courtney Trammell
Committee Chair
Term Expires 2020

Jeff Sanders
Committee Member
Term Expires 2020

Ryan Butte
Committee Member
Term Expires 2020

Juan Delgado
Committee Member
Term Expires 2021

Alyssa Gustafson-
Leary
*Council
Representative*
Term Expires 2021

Bill Arnold
Public Works Director
Ex- Officio Member

Charlie Dan
Committee Recorder

- I. **CALL TO ORDER**
- II. **ROLL CALL**
- III. **PEOPLE TO BE HEARD – 5 minute limit**
- IV. **APPROVAL OF AGENDA**
- V. **APPROVAL OF MINUTES**
 - a) September 18, 2019 Regular Meeting
 - b) October 16, 2019 Regular Meeting
 - c) November 20, 2019 Regular Meeting
 - d) December 18, 2019 Regular Meeting
- VI. **UNFINISHED BUSINESS**
 - a) Review Memorandum of Understanding (MOU) between City of Bethel and Lower Kuskokwim School District draft
 - b) Solid Waste/Dumpster Improvements Follow-up (Gustafson-Leary)
- VII. **NEW BUSINESS:**
 - a) City Paved Roads Conditions (Butte)
 - b) Installation of Crosswalks in High Traffic Areas (Trammell)
 - c) Elections for Chair and Vice Chair
 - d) Amending BMC 08.12.020 (Gustafson-Leary)
 - e) Amending BMC 08.12.030 (Gustafson-Leary)
 - f) YK Fitness Center Freeze-up Report (Butte)
- VIII. **DIRECTOR'S REPORT**
- IX. **COMMITTEE MEMBER COMMENTS**
- X. **ADJOURNMENT**

Posted January 9, 2020 at City Hall, AC Co., Swanson's, and the Post Office.

Charlie Dan, Public Works Assistant

City of Bethel, Alaska

Public Works Committee Meeting Minutes

September 18, 2019

Regular Meeting

Bethel, Alaska

I. CALL TO ORDER:

A regular Public Works Committee meeting was held on September 18, 2019 in the City Hall council chambers in Bethel, Alaska. Courtney Trammell called the meeting to order at 5:35 pm.

II. ROLL CALL:

Present: Courtney Trammell, Alyssa Gustafson, Jeff Sanders and Ryan Butte.
Excused Absence: Carol Jung-Jordan, Juan Delgado and Bill Arnold.

III. PEOPLE TO BE HEARD:-5 Minute Limit

IV. APPROVAL OF AGENDA:

MOVED BY:	Alyssa Gustafson	Motion to approve the agenda by moving Unfinished Business item B before item A.
SECONDED BY:	Ryan Butte	
VOTE ON MOTION	Motion carried by unanimous vote.	

V. APPROVAL OF THE MINUTES:

MOVED BY:	Alyssa Gustafson	Motion to approve meeting minutes for 08-21-2019.
SECONDED BY:	Ryan Butte	
VOTE ON MOTION	Motion carried by unanimous vote.	

VI. SPECIAL ORDER OF BUSINESS:

VII. UNFINISHED BUSINESS:

- A. Review Memorandum of Understanding (MOU) between City of Bethel and Lower Kuskokwim School District:

MOVED BY:	Ryan Butte	Motion to table Agenda item until details are finalized.
SECONDED BY:	Carole Jung-Jordan	
VOTE ON MOTION	Motion carried by unanimous vote.	

- B. Recommendation for a City of Bethel Code Enforcer:

MOVED BY:	Ryan Butte	Motion to suspend the rules to speak with City Planner, Ted Meyers.
SECONDED BY:	Alyssa Gustafson	
VOTE ON MOTION	Motion carried by unanimous vote.	

MOVED BY:	Ryan Butte	Motion to remove agenda item for 120 days for follow up.
SECONDED BY:	Alyssa Gustafson	
VOTE ON MOTION	Motion carried by unanimous vote.	

- C. Solid Waste/Dumpster Improvements Follow-up

VIII. NEW BUSINESS:

- A. Review Draft Ordinance for Six Yard Dumpster Rate

MOVED BY:	Alyssa Gustafson	Motion to send to City Council for approval.
SECONDED BY:	Ryan Butte	
VOTE ON MOTION	Motion carried by unanimous vote.	

IX. DIRECTORS REPORT:

X. COMMITTEE MEMBER'S COMMENTS:

C.Trammell- I apologize for interrupting throughout the meeting, thank you all for coming.

A.Gustafson- Thank you for being here.

J.Sanders- I recommend placing aprons on the shoulders of the highway.

R.Butte- Thank you all for coming to this meeting.

XI. ADJOURNMENT

MOVED BY:	Alyssa Gustafson	Motion to Adjourn.
SECONDED BY:	Ryan Butte	
VOTE ON MOTION	Motion carried by unanimous vote.	

With no further business, meeting adjourned at 7:06 PM.

APPROVED THIS _____ DAY OF _____, 2020.

Courtney Trammell
Committee Chair

Charlie Dan
Recorder of Minutes

City of Bethel, Alaska

Public Works Committee Meeting Minutes

October 16, 2019

Regular Meeting

Bethel, Alaska

I. CALL TO ORDER:

Courtney Trammell called the meeting to order at 5:35 pm.

II. ROLL CALL:

Present: Courtney Trammell, Jeff Sanders, Ryan Butte, Bill Arnold, and Charlie Dan

Excused Absence: Alyssa Gustafson

Unexcused Absence: Juan Delgado

No quorum was established due to lack of members, meeting was adjourned at 5:36 PM.

APPROVED THIS _____ DAY OF _____, 2020.

Courtney Trammell
Committee Chair

Charlie Dan
Recorder of Minutes

City of Bethel, Alaska

Public Works Committee Meeting Minutes

November 20, 2019

Regular Meeting

Bethel, Alaska

I. Quorum:

Committee members gave prior notice that they will not be able to attend this meeting. No Quorum was established due to lack of members.

APPROVED THIS _____ DAY OF _____, 2020.

Courtney Trammell
Committee Chair

Charlie Dan
Recorder of Minutes

City of Bethel, Alaska

Public Works Committee Meeting Minutes

December 18, 2019

Regular Meeting

Bethel, Alaska

I. Quorum:

Committee members gave prior notice that they will not be able to attend this meeting. No Quorum was established due to lack of members.

APPROVED THIS _____ DAY OF _____, 2020.

Courtney Trammell
Committee Chair

Charlie Dan
Recorder of Minutes

Marking and Signing Crosswalks

A marked crosswalk can benefit pedestrians by directing them to cross at locations where appropriate traffic control, including traffic signals or adult school crossing guards, either currently exist or can be provided. However, marked pedestrian crosswalks, in and of themselves, do not slow traffic or reduce pedestrian crashes.

It may be helpful to install marked crosswalks at signalized intersections or locations where crosswalks are typically marked, at key crossings in neighborhoods with designated school walking routes, and at certain types of uncontrolled crossings.

There are several reasons to install marked crosswalks, a few being:

- To indicate a preferred pedestrian crossing location.
- To alert drivers to an often-used pedestrian crossing.
- To indicate school walking routes.

Click on a link to learn more about:

- [Marked Crosswalks at Uncontrolled Crossings](#)
- [High-Visibility Crosswalks](#)
- [In-Street Signs](#)
- [Overhead Signs and Flashing Beacons](#)
- [In-pavement Flashers](#)
- [Advance Stop/Yield Line](#)
- [Parking Restrictions](#)



Image: A marked crosswalk guides students along the school walking route to Ocoee Elementary School in Orlando, Florida.

Marked Crosswalks at Uncontrolled Crossings

Marked crosswalks at uncontrolled locations must be carefully selected and designed to ensure that they enhance, rather than reduce, pedestrian safety. In some circumstances marked crosswalks should not be installed unless supplemental measures are taken to reduce traffic speeds, shorten crossing distances, enhance driver awareness, and/or provide an active warning of pedestrian presence.

Marked crosswalks alone (without other substantial treatments) should not be installed across uncontrolled roadways where the speed limit exceeds 40 mph or either:

- The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or
- The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.

Note: The wording above complies with the 2013 Traffic Control Device Handbook, Chapter 13.” The exact wording in the 2009 MUTCD on this issue is currently worded slightly differently and is being considered for revision by FHWA.

Marked crosswalks generally should be designed to minimize crossing distances and should be straight and in line with the sidewalk ramps to make them easier for children and adults with visual and/or physical impairments to navigate.

In many cases, crosswalk enhancements including raised median islands, traffic and pedestrian signals and/or street lighting may also be needed. More substantial improvements are typically needed on high-volume multilane roads.

Treatment: Marked Crosswalks

Description/Purpose

Marked crosswalks are painted pedestrian crossings that specify proper locations for pedestrians to cross the street.

Expected Effectiveness

Properly placed marked crosswalks can encourage pedestrians to walk at preferred crossing locations while increasing the visibility of and driver awareness of a pedestrian crossing location. There is, however, no proven reduction in pedestrian crashes resulting from marking crosswalks without adding other more substantial crossing treatments such as raised medians, traffic and pedestrian signals or improved nighttime lighting.

Costs

Costs range from an average of approximately \$750 for a striped crosswalk to nearly \$2,600 for a high visibility crosswalk (Bushell, Poole, Zegeer, Rodriguez, 2013). Maintenance costs should also be considered based on the paint material used.

Keys to Success:

- Locations chosen to have marked crosswalks should be convenient, accessible and in the direct pedestrian route[AASHTO, 2004]. For more information see the Institute of Transportation Engineers Traffic Control Devices Handbook, 2013 and Zegeer, 2002.

Key Factors to Consider:

- On multi-lane, high- volume roads (e.g., roads with three or more lanes combined with 12,000 or more vehicles per day), substantial treatments including raised medians are also needed so pedestrian crash risks do not increase.
- Crosswalk markings must be placed so that the curb ramp is within the crosswalk.

Evaluation Measures:

- Reduction in motor vehicle conflicts and increase in pedestrian activity within the crosswalk.

High-Visibility Crosswalks

Marked crosswalks guide pedestrians and alert drivers to a crossing location, so it is important that both drivers and pedestrians clearly see the crossings. Crosswalks can be marked in paint or a longer lasting plastic or epoxy material embedded with reflective glass beads. Although more expensive, longer-lasting, high-visibility crosswalk marking materials are a better value over time as they require less maintenance.

The minimum crosswalk width is six feet wide but should be wider at crossings with high numbers of pedestrians. School-related crosswalks should be checked annually before the start of the school year. If necessary, fresh paint should be applied and other improvements made to keep the crosswalks in good condition.

The 2009 MUTCD allows for two basic types of crosswalk designs, such as (1) traditional parallel lines; or (2) a high-visibility crosswalk pattern, such as a ladder, continental design, or diagonal marking. (See 2009 MUTCD, page 384.)



Crosswalk A is a traditional parallel line crosswalk.



Crosswalk B is high-visibility crosswalk with a ladder design.

In-Street Signs

In-street crosswalk signs must be installed at uncontrolled pedestrian crossings to make the crosswalk more visible and increase driver yielding. They are more likely to be effective on two-lane, low-speed streets than on multi-lane, high-speed streets, and are prohibited by the 2009 MUTCD at signalized intersections. They can be easily damaged and need to be reset or replaced when damaged.

In-street pedestrian crossing signs should be placed at the crosswalk in the street or on a median, but should not obstruct the pedestrian path of travel. In-street signs can be permanently installed in the roadway or mounted on a portable base to allow them to be taken in and out of the street as needed. When portable in-street signs are used for school crossings, they should be monitored by a school official or adult school crossing guard.

Each state's laws must be consulted to see if the "Stop For" or "Yield To" sign is appropriate for use.



Figure 1: In-street yield and stop signs. The 2009 MUTCD added a new option to use the schoolchildren symbol rather than the pedestrian symbol when an in-street sign is used at a school crossing. Image from the 2009 MUTCD.

Overhead signs and flashing beacons

School crosswalks with overhead signs (and sometimes flashing beacons) may be helpful in alerting drivers of a busy crossing at a wide or higher speed street. These are usually placed at mid-block crossings but can be used at intersections with uncontrolled crossings. Overhead signs are easier for drivers to see in cases where on-street parking, street trees, or other visual obstructions exist. Flashing beacons at a marked crosswalk may draw additional attention to the crosswalk. The beacons can be set with a timer to flash only during crossing times, or can be pedestrian-activated by an automatic detector or push button such that they only flash when pedestrians are present. In other locations the beacons are set with a timer to flash only during crossing times, or are pedestrian-activated by an automatic detector or push button and only flash when pedestrians are present.

Various school warning signs are also available for use in school areas.

These signs include school advance signs to alert motorists that they are entering a school zone where children are present. A school crossing sign at the crosswalk should have a down arrow. School speed limit signs (e.g., "School: Speed Limit 20") may also be used to give advance warning to motorists to slow down as they enter the school zone. Examples of such school zone signing are illustrated below (Figure 3).

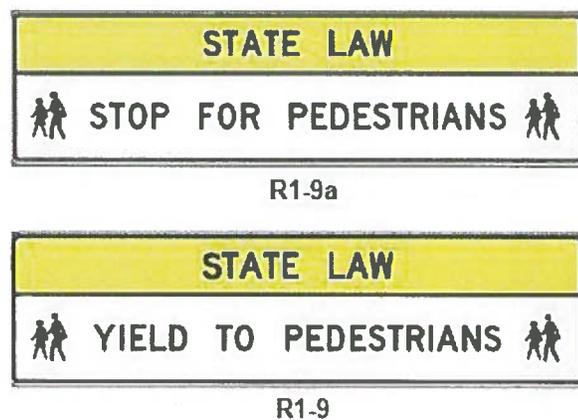


Figure 2: Overhead pedestrian crossing sign. The 2009 MUTCD allows the use of the schoolchildren symbol as shown in the modified image above. Image from the 2009 MUTCD.

School Advance
Crossing Assembly

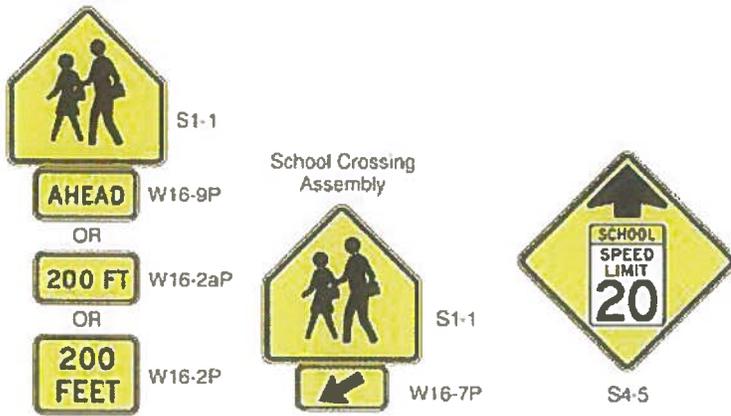


Figure 3.

Rectangular Rapid Flashing Beacon

Rectangular rapid flashing beacons (RRFBs) are active warning devices used to alert motorists of crossing pedestrians at uncontrolled crossings. They remain dark until activated by pedestrians, at which point they emit a bright, rapidly flashing yellow light .

Studies suggest that RRFBs can significantly increase yielding rates compared to standard pedestrian warning signs alone. Results have shown that motorist yielding can be increased from baselines averaging 5% to 20% with the standard pedestrian warning sign treatment only to sustainable yielding rates of 80% or higher with this device.

RRFBs shall be installed on both the right and left sides of the roadway. They are not currently included in the MUTCD, but jurisdictions can use them if they obtain approval from FHWA, under the terms and conditions of Interim Approval II (see section IA.10 of the MUTCD).



Image: Provided by PBIC Designing for Pedestrian Safety Course.

In-pavement Flashers

Crosswalks with in-pavement flashers can be expensive to install and maintain, and should only be selected after first considering other solutions. The [2009 MUTCD](#) allows them at uncontrolled crossings to alert drivers to crosswalks, but does not allow them at crosswalks controlled by traffic signals, STOP signs or YIELD signs. Crosswalks with in-pavement flashers are expensive to install and maintain, and should not be selected without first considering other solutions.

A 2009 review of literature on in-pavement flashing lights may be found on the [Pedestrian and Bicycle Information Center's](#) website. Evaluations of use of in-roadway warning lights are available from [Washington](#) and [Florida](#).



In-pavement flashers at crosswalks are also an option that can be considered.

Advance Stop/Yield Line

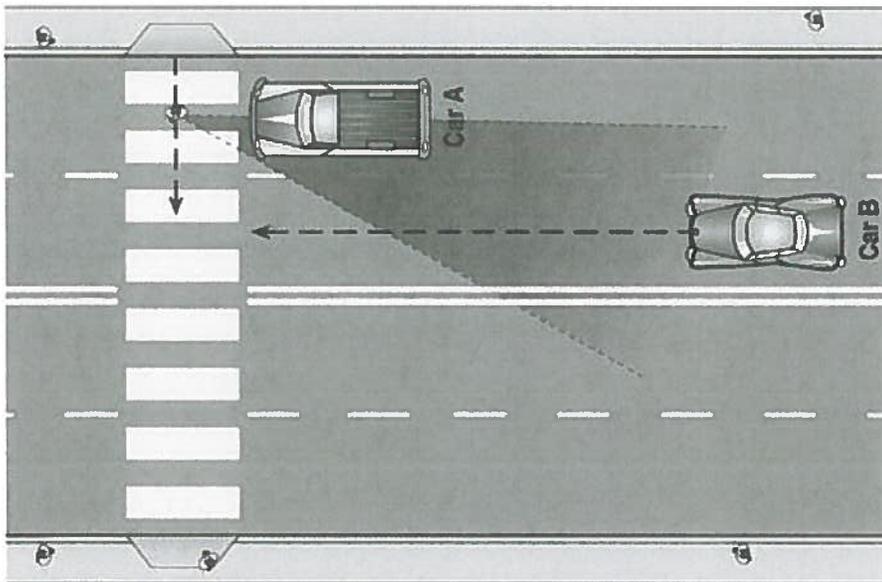
Advance stop or yield lines encourage drivers to stop further back from the crosswalk, promoting better visibility between pedestrians and motorists, and helping to prevent multiple-threat collisions at mid-block or uncontrolled crossings.

A multiple-threat collision is a pedestrian crash that occurs when pedestrians have to cross more than one lane in each direction. A motor vehicle in one lane stops and provides a visual screen to the motorist in the adjacent lane. The motorist in the adjacent lane continues to move and hits the pedestrian.

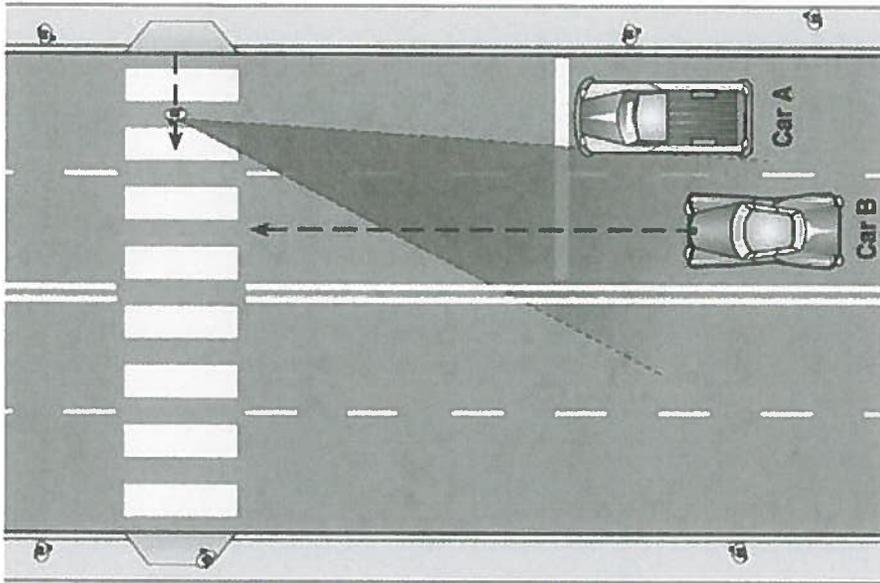
The [2009 MUTCD](#) recommends that yield or stop lines used at uncontrolled multi-lane crossings be placed 20 to 50 feet in advance of the crosswalk; however, according to PEDSAFE 2013, a setback of 30 feet for the advance stop or yield lines (in advance of the crosswalk) has been found to be appropriate for most situations. At signalized midblock locations, the [2009 MUTCD](#) recommends separation of a least 40 feet between the stop line and the nearest signal indication.



A yield line consists of multiple painted triangles (shark's teeth) .



Problem: Car A stops to let pedestrian cross; car A masks car B, obstructing the pedestrian's and car B's view of one another. Car B doesn't stop and may hit the pedestrian at a high rate of speed.



Solution: Place advance stop/yield line so car A stops further back; car A no longer masks car B, which can better see and be seen by the pedestrian."

The following signs are required (MUTCD 2B.11) to reinforce advance stop or yield lines.



Figure 3: Examples of STOP and YIELD here to pedestrian signs. Image provided by PBIC Designing for Safety course.

Parking Restrictions

Restricting parking in advance of crosswalks can improve visibility of the crossing for both drivers and pedestrians. At a minimum, 20 feet should be kept clear in advance of marked crosswalks to help pedestrians and drivers see each other better. Distances

greater than 30 feet are generally better, but parking restrictions have to be balanced with the needs of businesses and motorists. For example, if parking is severely restricted or completely removed near schools, parents may ignore all parking restrictions.



Removing parking from corners can improve visibility between pedestrians and approaching motorists.

Treatment: Parking Restrictions at Corners

Description/Purpose

Restricting how close motor vehicles may park to a crosswalk (20 foot minimum per [MUTCD](#)) to improve pedestrian and motorist sight distance.

Expected Effectiveness

Eliminating parking spaces too close to a crosswalk will improve pedestrian and motor vehicle visibility, which can reduce the likelihood of pedestrian-vehicle conflicts and collisions.

Costs

Costs involve new street markings, signs, enforcement and public education efforts. Roadway reconstruction issues may also affect the overall cost [Zegeer et al., 2004].

Keys to Success

- Accurately identifying problem locations and appropriate improvements.
- Educating the public about the purpose of proposed improvements.
- Enforcing parking restrictions.

Key Factors to Consider

- Potentially strong resistance to the loss of parking spaces by business owners and local residents, especially in areas with limited parking.

Evaluation Measures

- Number of crossing pedestrian crashes.
- Number of pedestrian-vehicle conflicts.

This guide was developed by the Pedestrian and Bicycle Information Center (PBIC) in collaboration with SRTS experts from around the country and support from the National Highway Traffic Safety Administration (NHTSA), Federal Highway Administration (FHWA), Centers for Disease Control and Prevention (CDC) and Institute of Transportation Engineers (ITE). [View full list of contributors.](#)



Design & Construction Standards

Traffic and Safety Resources

Railroad-Highway Crossings



Approximately 219 public at-grade railroad-highway crossings exist on Alaska's roads and highways. Additional crossings exist on private lands. Railroad companies and the Alaska Department of Transportation and Public Facilities (DOT&PF) share responsibility for maintaining and providing traffic control devices at public crossings.

Alaska has two railroads:

- The Alaska Railroad (ARR), which runs approximately 650 miles from Seward to Eielson Air Force Base near Fairbanks, and
- The historic White Pass-Yukon Railroad, which runs from Skagway to the international border with British Columbia—about 20 miles—and on to Carcross, Yukon Territory, a total of 67 miles.

The Alaska Traffic Manual (ATM) gives guidance for selection of traffic control devices for at-grade railroad-highway crossings and refers to the DOT&PF/ARR Policy on Railroad/Highway Crossings, which defines a process for further analysis.

The Federal Railroad Administration maintains an inventory of public railroad-highway crossings, with the cooperation of states and railroads.

Train/vehicle collisions in Alaska have declined significantly since the early 1980s.

Related Links

- [Alaska Policy on Railroad/Highway Crossing](#) ↗
- [Inventory of Public At-Grade Motor Vehicle Crossings](#) Ⓜ
- [Alaska Rail-Highway Crossing Accident Experience](#) ↗
- [Alaska Traffic Manual](#), see Part VIII Traffic Control Systems for Railroad-Highway Grade Crossing
- [Railroad-Highway Grade Crossing Handbook 2007](#) ↗
- [Railroad Coordination and Certification Requirements](#) Ⓜ
- [Guidance: RR-Hwy Crossings Within or Near Project Limits](#) Ⓜ
- [Grade Crossing Improvement Guidance - 23 CFR 646.214](#) ↗
- [Railroad Coordination and Certification for Traffic Control Devices – Maintenance Activities](#) ↗
- [FHWA Office of Safety - Highway-Railroad Grade Crossing](#) Ⓜ
- [Alaska Railroad Corporation](#) Ⓜ
- [White Pass-Yukon Railroad](#) Ⓜ



DUMPSTER REGULATIONS:

KEEP THIS AREA CLEAN

**DUMPSTERS ARE FOR HOUSEHOLD
TRASH ONLY**

**DO NOT PLACE BULKY ITEMS
INCLUDING:**

- **APPLIANCES**
- **FURNITURE**
- **OVERSIZED ITEMS**
- **MOTORIZED EQUIPMENT**

FOR BULKY ITEM PICK UP, CALL 543-3150

**LANDFILL HOURS: MONDAY - SATURDAY 8AM - 6PM
LANDFILL 543-7711 OR PUBLIC WORKS 543-3110**

8.12.020 Nonbiodegradable plastic carry-out bags.

- A. Affected retail establishments, food vendors and nonprofit vendors are prohibited from providing plastic carry-out bags to their customers at the point of sale to transport purchased items. Reusable bags, recyclable paper bags and compostable bags, including biodegradable plastic bags, are allowed alternatives.
- B. Nothing in this section shall be read to preclude affected retail establishments, food vendors and nonprofit vendors from making recyclable paper bags available to customers.
- C. Affected retail establishments, food vendors and nonprofit vendors are encouraged to provide incentives for the use of reusable bags through education and through credits or rebates for customers that use reusable bags at the point of sale for the purpose of carrying away goods.
- D. No person shall distribute plastic carry-out bags at any city facility or any event held on city property. [Ord. 09-12 § 2.]

The Bethel Municipal Code is current through Ordinance 19-20, and legislation passed through October 8, 2019.

Disclaimer: The city clerk's office has the official version of the Bethel Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

[City Website: www.cityofbethel.org](http://www.cityofbethel.org)

[Code Publishing Company](#)

8.12.030 Polystyrene foam disposable food service ware.

- A. Except as provided in BMC [8.12.040](#), food vendors are prohibited from providing prepared food to customers in disposable food service ware that uses polystyrene foam.
- B. All city facilities are prohibited from using polystyrene foam disposable food service ware and all city departments and agencies will not purchase or acquire polystyrene foam disposable food service ware for use at city facilities.
- C. All food vendors using any disposable food service ware will use biodegradable or compostable disposable food service ware unless they can show an affordable biodegradable or compostable product is not available for a specific application. Food vendors are strongly encouraged to reuse food service ware in place of using disposable food service ware. [Ord. 09-12 § 2.]

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[Code Publishing Company](#)

8.12.040 Exemptions.

- A. Prepared food prepared or packaged outside the city of Bethel is exempt from the provisions of this chapter. Purveyors of food prepared or packaged outside the city of Bethel are encouraged to follow the provision of this chapter.
- B. Food vendors will be exempted from the provisions of this chapter for specific items or types of disposable food service ware if the city administrator or his/her designee finds that a suitable affordable biodegradable or compostable alternative does not exist and/or that imposing the requirements of this chapter on that item or type of disposable food service ware would cause undue hardship.
- C. Polystyrene foam coolers and ice chests that are intended for reuse are exempt from the provisions of this chapter.
- D. Disposable food service ware composed entirely of aluminum is exempt from the provisions of this chapter.
- E. *Emergency Supply and Service Procurement.* In a situation deemed by the city administrator to be an emergency, for the immediate preservation of the public peace, health or safety, city facilities, food vendors, contractors and vendors doing business with the city shall be exempt from the provisions of this chapter. [Ord. 09-12 § 2.]

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[Code Publishing Company](#)

Pool Building Report

A culmination of issues produced the “perfect storm” scenario that could have easily brought the aquatic center to a white flag surrender condition. However, close attention to detail and swift response of tell tail signs prevented what could have been a MUCH, MUCH worse scenario for the building. I think everyone would be pleased to know, at NO time did our pool building come close to becoming an ice skating rink. Also, normally occupied spaces remained well above freezing temperatures with the exception of the North, North West corner of the building (conference room and arctic entry). I think it is also important to state, at all times throughout the building closure, the primary heating systems have been operational.

All issues except one stem directly from the subzero temperatures and the extended length of time the building was exposed to them. In addition to the subzero temperatures, a multitude of building design, building construction and installation problems have directly impacted the buildings ability to function properly. This resulted in multiple compounding and separate issues. I will elaborate in greater detail on these issues later in this report.

Summary of events and findings:

Initially, pool staff reported standing, slow draining water in both locker rooms as the main concern. No other major issues were noted at the time. City of Bethel maintenance staff immediately responded by conducting a thorough inspection of the buildings accessible crawl spaces. A search for evidence of a slow/poor drainage source was the goal. ***Key Note: The majority of the facility's domestic water and sewer lines are located below the sub floor in an accessible crawl space below the Natatorium side of the building. The accessible crawl space is adequately heated by 4 large unit heaters controlled by the BAS (Building Automation System). Typical temperatures in this crawl space have been 50 degrees or above but vary on sides from outside wind direction and temperatures.***

The inspection of the accessible crawl space found No breaks, no leaks, no standing water, nor signs of ice near or around ANY of the domestic water or sewer lines. The space did however, feel notably cooler than normal. Approximately 40F – 45F degrees on the windward (North). The south and South West side of the crawl space was above 70F degrees. The warm and cold side of the crawl space is heavily dependent on the wind conditions and temperature outside. Weather conditions during the time of the crawl inspection was -24F degrees with a very strong sustained North wind. It was reasonable to expect the northern portion of the crawl space would be colder due to this. We have seen this previously, but not to this extent.

Regardless of the prevailing colder temperatures outside, this led City Maintenance staff to check heating lines and unit heaters for appropriate supply temperatures. Heating lines were found hot to touch but not 180F – 200+F degrees hot (as normal). The cooler than normal heating lines, led maintenance to check for accurate commands of actuators and valves from the BAS system. A single actuator/valve combo associated with the Glycol heating system was discovered as “tripped”. Maintenance staff reset the tripped actuator and immediately, correct temperatures began flowing to all glycol heated systems throughout the facility. Significant warming changes were felt within 30 minutes.

The discovery of the tripped actuator initiated maintenance to check all other related glycol heated systems, which included a glycol heat loop (pex) that supplies warmth to the arctic pipe that protrudes from the facility, within the accessible crawl space to the lift station located on the Eastern side of the building. Both the supply and return pex lines were found cold to the touch but warming significantly on the supply side as glycol heating had been restored. The glycol to this heat loop is automatically controlled through the facility's BAS. Maintenance observed both supply and return pex lines returned to adequate temperatures within several minutes as a result of resetting the tripped actuator.

This, in turn, led maintenance to check the status of water flow into the lift station from the arctic pipe exiting the building. The lift station was opened and found to be completely full and frozen. Maintenance immediately began troubleshooting the reason for the lift station freeze up. Utility maintenance was called to assist and responded quickly. Utility Maintenance found both pumps tripped at the control terminal and non-operational, regardless of selector position. Level sensors were frozen and non-responsive also. Ice was also found in the sewer lines from the lift station to the city sewer system. It was suspected the heat trace was not working and troubleshooting of that system began immediately. The service switch for the sewer heat trace is located inside the pool facility electrical room. Sewer heat trace was found in the energized position however, the 60A circuit breaker associated on the panel was found tripped. Breaker was reset and power restored to the heat trace that runs from the lift station and along the city sewer pipes.

Within two days, the standing water in the facility floor drains began draining properly. On day three, all standing water within the facility had drained appropriately. Lift station had also mostly thawed.

During the "thawing" days, very close attention was given to the building and its systems because temperatures still seemed to be lower than expected for many areas within the building. Cold external temperatures were initially thought to be the reason behind this but we wanted to be sure there wasn't a BAS problem. Maintenance staff stood watch in rotation within the facility to monitor and ensure ALL heating systems remained online and in operation. City maintenance staff and acting pool manager Shadi conducted a thorough look of the systems associated with the BAS. Many minor issues were observed. Several examples of findings are:

- BAS system incorrectly reporting Actuators/valves position as compared to actual position. (% closed or open on BAS system screen versus actual position on the actuator itself)
- Non-operating actuators/valves (non-responsive to BAS programmed commands)
- Non-operating actuators/valves (non-responsive to BAS override commands)
- Actuators wired or programmed backwards (actuators closed when commanded and reporting open or vice versa)
- Two devices on BAS system were not locatable when cross referencing "As Built" drawings.
- Strange distribution and programmed commands of heat to cold spaces regardless of programmed temperature set points.
- Potentially failed temperature sensors
- Building exhaust commanded fully open blowing MASSIVE amounts of heat outside when suspected it should be in command closed.
- Slow or Intermittently operating actuators from BAS commands (override run and program run)
- Extremely poor slab temperatures in several zones regardless of actuator/valve position.

- Temperature readings within the BAS that did not concur with actual readings taken by maintenance staff. (ex: 115F BAS reported versus 50F actual temperature reading)

These strange findings resulted in the City of Bethel maintenance requesting immediate quotation for Long Building Technologies (BAS System providers and support) to provide a technician to the facility AS SOON AS POSSIBLE, to assist in troubleshooting, servicing and replacing any failed components to the BAS programming and physical components. *(Quotation was received and awaiting City Managers approval. Also note: Regardless whether quotation had been approved sooner, Long Building Technologies has stated they cannot provide a technician immediately because they do not have one available to send, but would send parts ahead of time for City of Bethel maintenance to replace if capable.)*

During the several days waiting for the sewer line and lift station to thaw, additional problems arose further delaying progress to open the facility back to the public and increasing the demand for staff presence within the building.

- Domestic water line located in a non-accessible interstitial crawl space in the North West portion of the building froze and burst flowing water into the interstitial space until filling the space and then leaking outside.
 - o City maintenance staff once again immediately jumped in with ALL hands. Water was shut off to the building and troubleshooting the causes became priority. Water leak was located in the North portion of the building, in the North West corner below the concession and reception area. Access to the North side interstitial crawl space was gained by a cut out opening (2Ft x2Ft approximate) in the lower soffit MIP (Metal Insulated Paneling) from underneath, and exterior of the building. The space is inaccessible from within the building and must be entered from outside, below the building. The space is divided by a large structural I-beam running East to West. Two separate openings were required to access each crawl space. A domestic waterline was found burst from exposure to severe cold temperatures. Repairs were made to the broken water line and water left OFF within the facility to prevent reoccurrence. Examination of the entire North side crawl space was conducted by maintenance staff. Crawl space was as cold as it was outside of the building. Maintenance found absolutely NO heating system (Unit Heaters, Radiant Fin, Radiant floor etc.) anywhere within the entire space. In addition, significant amount of air penetrations were discovered at the piling to structural beam penetrations, MIP panel joining locations, as well as wall to soffit joining locations. Several penetrations are large enough to pass an entire hand through (3+inches wide). Cold air can be felt BLASTING through almost each and every open areas with varying degree. City Maintenance foreman reached out to the original architects for assistance in what would be the best temporary solution until a more thorough evaluation could be conducted and proper repairs made. Architects suggestion was to fill the air voids and penetrations with an insulating batting material. City of Bethel purchased materials and began patching the open areas to limit cold air penetration within the entire interstitial crawl space. This remedy showed significant changes to the space temperature when aided by a Frost fighter affixed in the 2ft x 2ft access opening to blow hot air into the space. Space is able to maintain an above freezing temperature $\frac{3}{4}$ of the way across (West to East) so long as the frost fighter is

operational. Maintenance staff are manning a rotational shift outside of normal working hours to keep the frost fighter fueled and providing heat to the space. Please note: the Far East side of the crawl space is not able to keep an above freezing temperature. There is both domestic water and sewer drains on the East side of the building that remain frozen at this time.

- Sewer lines located in the same inaccessible interstitial crawl space in the North West and North East portion of the building froze solid.
 - o Same countermeasure essentially as the broken waterline in the same space.
- Fire Suppression Sprinkler lines above the drop ceiling in North West portion of building froze and were discovered slowly leaking into the interior spaces.
 - o City Maintenance removed several of the drop ceiling tiles in both the arctic entry area as well as the conference room. Temperatures above the drop ceiling tiles was FRIGID. Large amounts of cold air could be felt falling from the space above the ceiling tiles. Large air penetrations were discovered at the joint where the top wall and roof structure joined. Essential outside air was blasting through this penetration into the space above the ceiling tiles. This cold air resulted in a freeze up of the fire suppression system in these two locations. Bursting two Victaulic fittings within the ceiling of the conference room. Similar to the crawl space below where NO heating system was found and the space was as cold as outside. Fire alarm system was placed in troubleshoot test mode, fire suppression lines were drained and system placed OFFLINE. City maintenance conducted repairs on the Victaulic fittings. System was recharged with water after repairs. City Maintenance staff began insulating the air penetrations in both the conference room and arctic entry with R38 unfaced batting and 1.5 inch foam board. During the insulation install one of the city maintenance employees discovered additional water spraying from a three way connection on the fire suppression system. The system was once again drained down and further inspections for fail points were discovered. Accel Fire in Anchorage was contacted to order parts and technician arranged for travel to arrive in Bethel the following Monday (Jan 6th). System remained off and drained until Fire Suppression technician could arrive and further inspect and replace. City maintenance staff continued with insulating the arctic entry space, but quickly realized further insulating could not continue as it would prevent the fire technician from reaching the fail points. Technician arrived Monday, as planned, and conducted inspection of the suppression system. During his inspection he found two additional fail points. He attempted to order the parts from Anchorage but none of the suppliers had inventory on hand. Parts were located in the lower 48 and GOLDSTREAK order was placed. Parts are expected to arrive end of the week (Jan 10th) Technician remaining in town until parts arrive to then install and bring system back online.

City of Maintenance staff make several deep walkthroughs of the pool building each and every day to ensure building is remaining warm and search for any new or potentially new problems. City of Bethel maintenance staff are continuously fueling the Frost Fighter providing heat to the unheated crawl space on the north side of the building. On Jan 7th, Building maintenance found the boiler system to have lost a significant amount of boiler pressure and began troubleshooting. A full search of the building was conducted to find a heating system failure. No fail points found and troubleshooting is continuing. Boiler system was recharged to normal operating pressures. Within one hour the system once again indicated

low boiler pressures. A thorough search began again, to include isolating each boiler from the system to determine if there may be a leak within the boiler itself. As of the time I am writing this, problem is still undetermined but poses a serious risk to keeping the pool building heated adequately. City of Bethel staff is continuously monitoring the building, the heating systems