cyclomedia

Road Markings PFC

Product Description

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1. Introduction

A road mas a Point Feature Class (PFC). This provides you with a complete overview of all important features in order to:

- Perform easy and accurate budgeting.
- Easily and accurately plan maintenance.
- Validate performance contracts.
- Analyze the traffic safety conditions.

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2. Specifications

2.1 Inventoried objects and attributes

Road markings as point features

The features are annotated as a 3D point. Additionally, the type of road marking is included, for instance “Cross walk”, “Bike lane symbol,” etc.. Optionally, the condition of the road markings can be assessed through visual inspection based on imagery.

2.2 Geographical scope

Only road markings that are visible on the GeoCycloramas and are within 20 meters of the recording locations will be annotated. The overall geographical scope is defined by the customer during ordering.

2.3 Location and geometry

The road markings are delivered as a 3D Point. Placement of the point for each type of feature is shown in the table in 2.6 Annotated features.

2.4 Accuracy and completeness

- Positional accuracy:
  The average standard deviation of all the measured points is 6 inches (1-σ) in all directions, except in long tunnels, woody areas and urban canyons.
- Completeness:
  Over 98% of all the road markings that are visible on the GeoCyclorama, and are within 20 m from Cyclorama recording locations, are inventoried.

2.5 Condition Assessment

The condition of each road marking is visually assessed from the GeoCycloramas. The condition assessment is based on comparison with example images in 4 categories (for instance: ‘Pristine’, ‘Regular wear’, ‘> 30% damage’ , ‘>50% damage’. (**Final catagories to be defined together with the customer**). The condition category is a stored as an attribute for each feature.
Condition assessment is an optional feature.

2.6 Annotated features

The features that are annotated and are delivered in the final dataset are:

Type of feature	Comments
Transverse stop lines (stop bar)	
Yield Lines	
Do Not Block Intersection Markings	In case there is no box, only text, this will be annotated as text
Cross Walks (standard,non-filled)	
Cross Walks (longtitudinal striping)	
Cross Walks (diagonal striping)	
Any text and numerals	Any text **and** numerals such as (but not limited to): STOP, STOP AHEAD, YIELD AHEAD, SCHOOL XING, SIGNAL AHEAD, PED XING, SCHOOL, R X R, BUMP, HUMP, YIELD, RIGHT (LEFT) TURN ONLY, 25 MPH. The actual text will **not** be inventoried. The Type attribute will simply be: **Text**
Arrow markings	Any type of arrow markings, such as (but not limited to) Through lane , Turn Lane, Wrong Way, Bike Lane and Lane reduction arrows, Arrow like features used for speed humps will be annotated as speed hump symbols.
HOV Lane Symbol	
Bike Lane Symbol	
Yield ahead Symbol	
Speed Hump Markings	Only the types shown in the MUTCD will be annotated.
Route Shields	
Advance Warning Markings for Speed Humps	

The features in the table are defined in the MUTCD - 2009 Edition with Revision Numbers 1 and 2 incorporated, dated May 2012 (PDF) - Part 3 – Markings (https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part3.pdf). They will be annotated only if these correspond with the definition of the MUTCD. For instance, an HOV symbol that differs from the definition of the MUTCD will not be annotated.

Everything else that is not mentioned in the table above is **excluded** from annotation, such as (but not limited to): longitudinal lane markings, channeling markings, markings for obstructions in the roadway, chevron markings, crosshatch markings, markings for obstructions in the roadway, parking space markings, speed reduction markings.

3. Delivery

3.1 Format

- The dataset consists of 3D point geometries, in the projection system chosen by the customer.
- The dataset will be delivered through a download link.
- The dataset will be delivered in the following formats:
  - ESRI Shapefile
    ESRI Shapefiles are easily imported into all regular GIS packages.
  - Excel
    The Excel file allows for an easy analysis of the attribute data using standard spreadsheet tools.

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3.2 Data structure

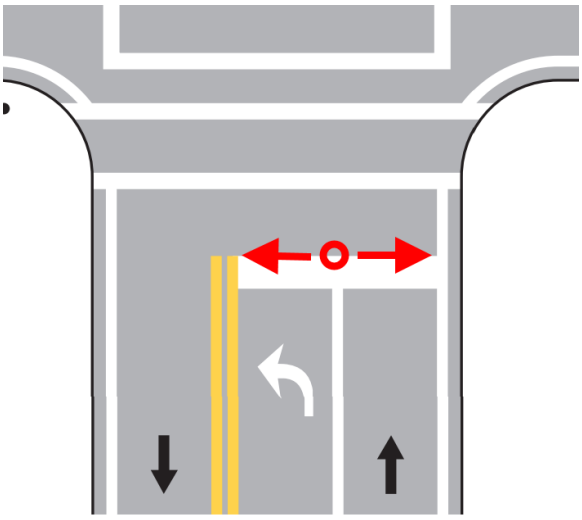
FID	Unique ID
Geometry	Binary geometry (Shapefile only, not in excel)
X	X-coordinate
Y	Y-coordinate
Z	Z-coordinate
stdx	Standard deviation in X
stdy	Standard deviation in Y
stdz	Standard deviation in Z
Type	Type of road marking. One of the following: Transverse stop lines (stop bar) Yield Lines Do Not Block Intersection Markings Cross Walks (standard,non-filled) Cross Walks (longtitudinal striping) Cross Walks (diagonal striping) Text Arrow markings HOV Lane Symbol Bike Lane Symbol Yield ahead Symbol Speed Hump Markings Route Shields Advance Warning Markings for Speed Humps
Condition	The physical condition of the road marking. This attribute is optional.

4. Geometry placement

Each feature is annotated as a point. The location of annotation is displayed in the table below.

When the location is fixed this is indicated with a  . If the location is variable, depending on visibility for instance, possible annotation locations are defined by a circle with arrows,  , where the arrows give range of possible locations.

 indicates the driving direction.

Type of feature	Annotation Placement	Comment
Transverse stop lines (stop bar)	 The point is placed along the boundary furthest away from the drivers perspective	

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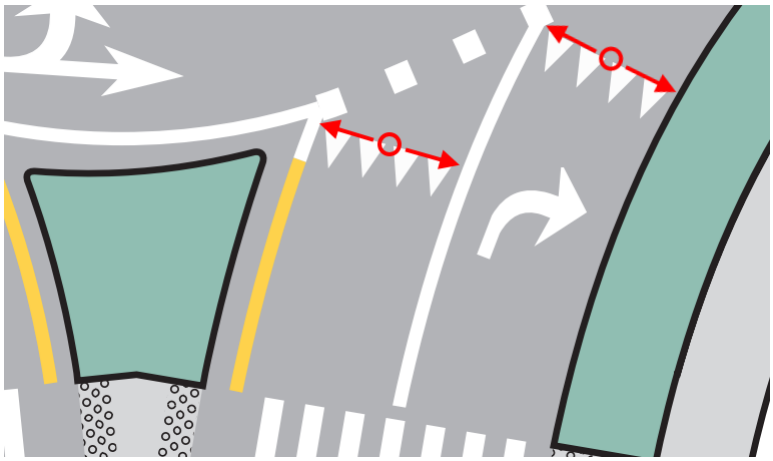
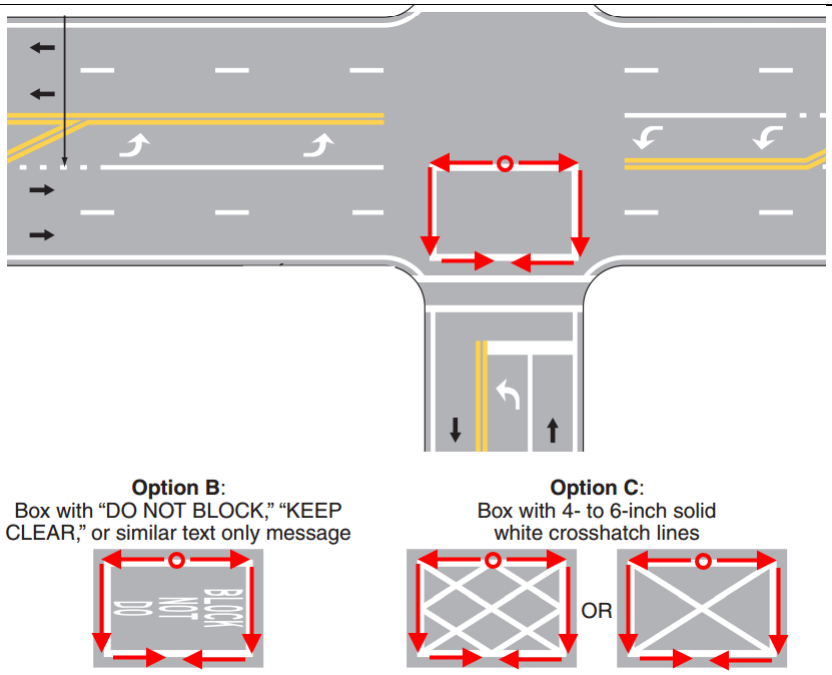
Yield Lines	 The point is placed along an imaginary line at top of the yield line.	
Do Not Block Intersection Markings	 The point is placed anywhere along the outer border of the marking.	

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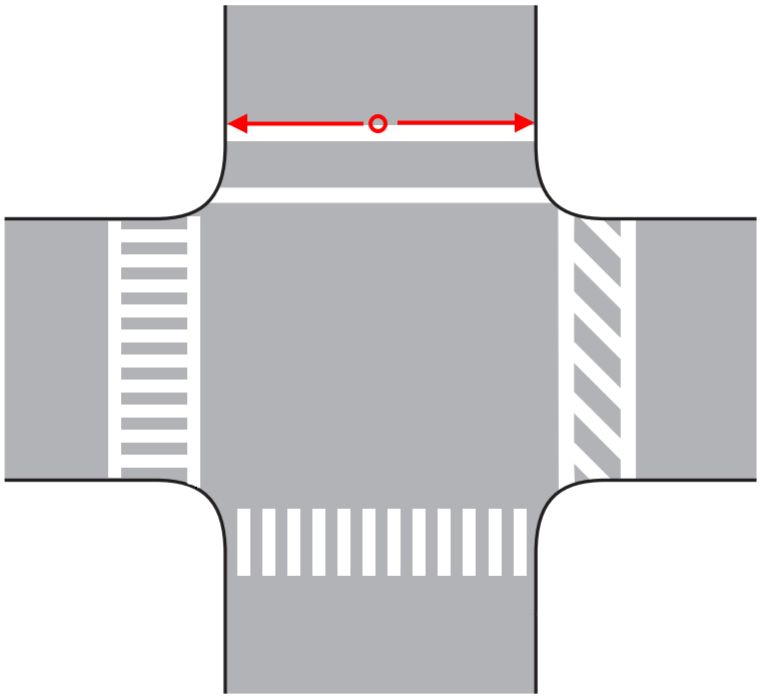
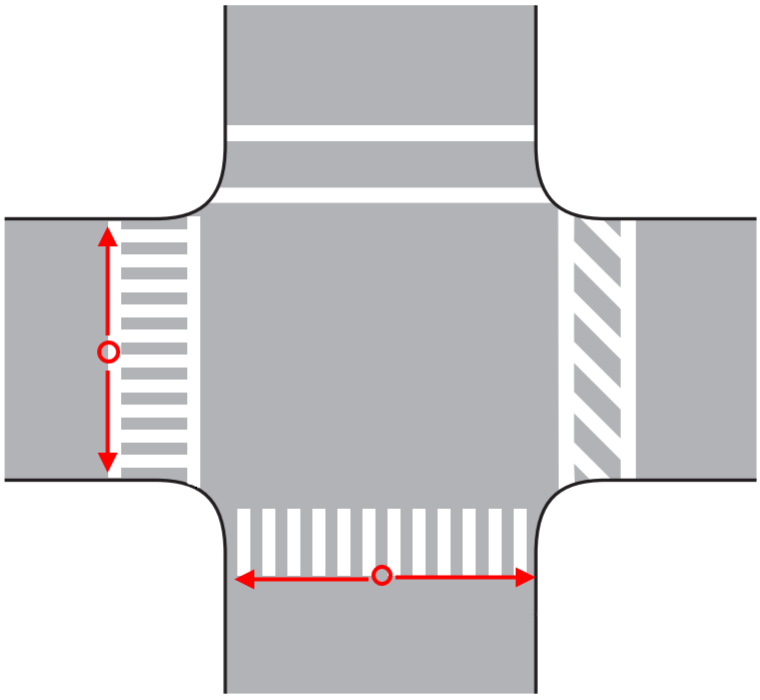
Cross Walks (standard,non-filled)	 The point is placed along the outer border of the cross walk that is furthest from the intersection.	
Cross Walks (longtitudinal striping)	 The point is placed along the outer border of the cross walk that is furthest from the intersection.	

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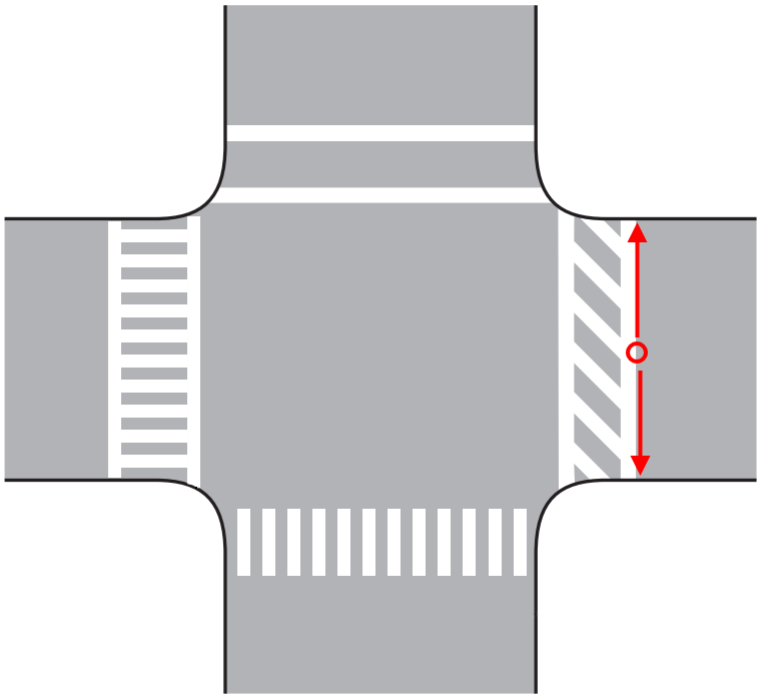
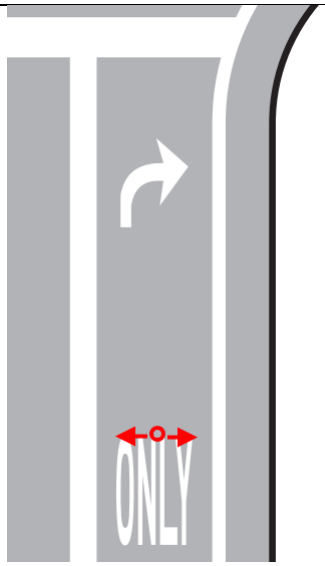
Cross Walks (diagonal striping)	 The point is placed along the outer border of the cross walk that is furthest from the intersection.	
Any text and numerals	 The point is placed along an imaginary line at top of the text or numeral.	

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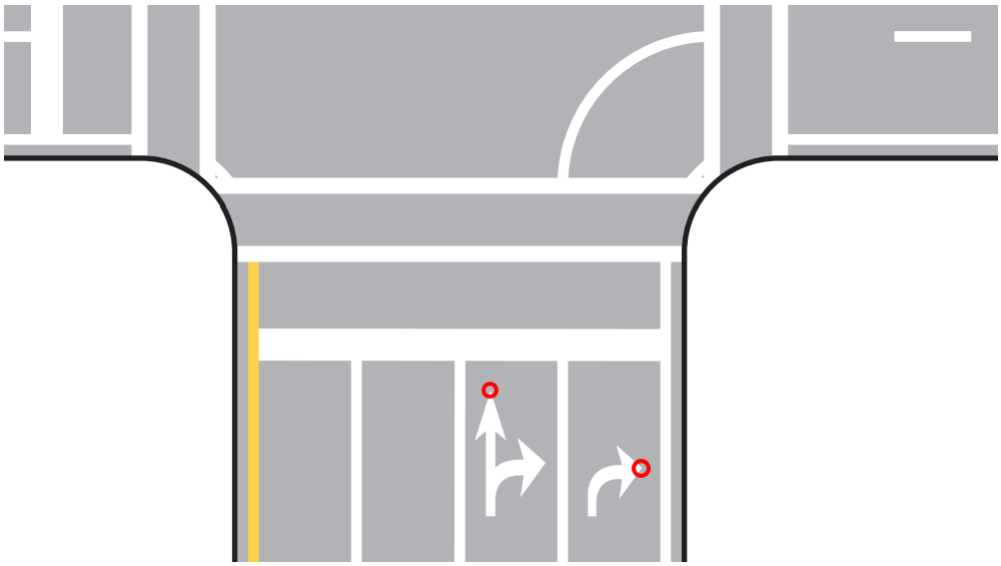
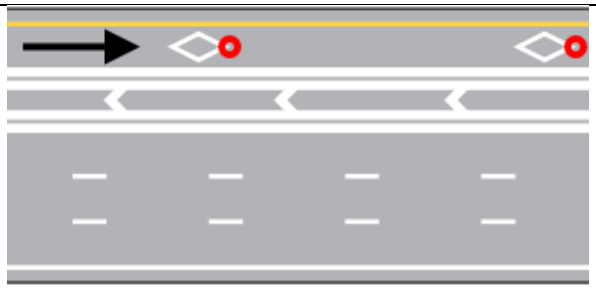
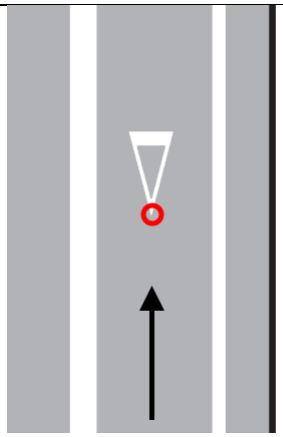
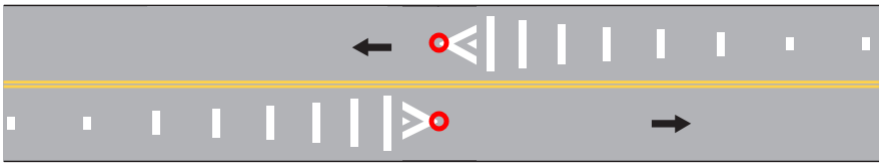
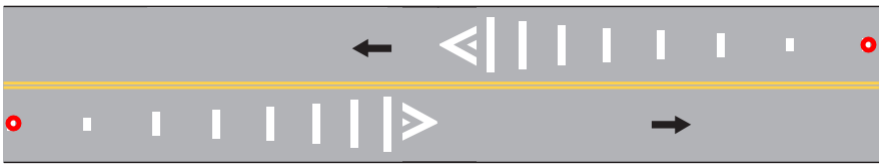
Arrow markings	 The point is placed at the tip of the arrow that is furthest from the driver.	
HOV Lane Symbol	 The point is placed at the tip of the diamond that is furthest from the driver.	
Bike Lane Symbol	 The point is placed at the top of the bike symbol.	

Yield ahead Symbol	 The point is placed at the bottom tip of the yield symbol.	
Speed Hump Markings	 The point is placed at the tip of the largest arrow.	
Advance Warning Markings for Speed Humps	 The point is placed only at the first line of the warning marking seen from the drivers perspective.	
Route Shields	 The point is placed at the bottom center of the shield.	