

assetType NODE

{ assetUid: 'NODE-X',
parentAssetUid: null,
eventTypes: ['HEALTH_REPORT'],
mediaType: null,
assetType: 'NODE',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {} }

assetType CAMERA

{ assetUid: 'CAM-X',
parentAssetUid: 'NODE-X',
eventTypes: ['PKOUT', 'PKIN',
'TFEVNT', 'PEDEVT',
'BICYCLE'],
mediaType: 'IMAGE,VIDEO',
assetType: 'CAMERA',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {
HOMOGRAPHY: 'x,x,x,x,x,x',
CENTER_GEO_COORDINATE:
'{LAT}:{LONG}',
IMAGE_SIZE: 'X:Y',
VIEW: 'X' } }

assetType ENV_SENSOR

{ assetUid: 'ENV-X',
parentAssetUid: 'NODE-X',
eventTypes: ['TEMPERATURE',
'HUMIDITY',
'PRESSURE'],
mediaType: '',
assetType: 'ENV_SENSOR',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {} }

assetType EM_SENSOR

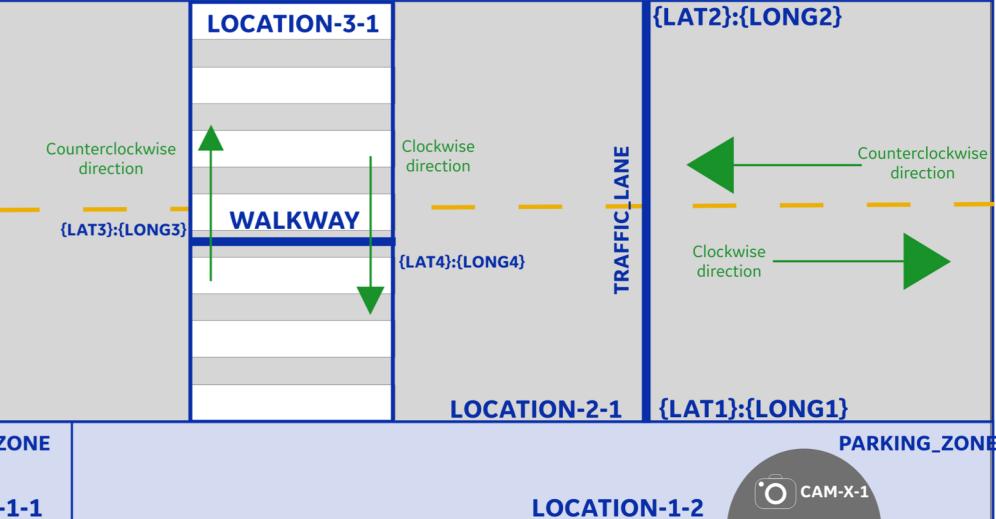
{ assetUid: 'EM-X',
parentAssetUid: 'NODE-X',
eventTypes: ['METROLOGY',
'ENERGY_ALERT',
'ENERGY_TIMESERIES'],
mediaType: null,
assetType: 'EM_SENSOR',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {} }

CityIQ Metadata Service

The Metadata Service provides users with static data such as assets and physical locations with their properties and identifiers.

json responses in blue are obtained using the metadata service url

Sample Responses are described here in json. Please note, data is only available by permissions granted by your municipality.



locationType PARKING_ZONE

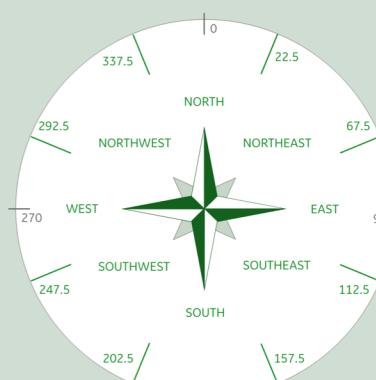
{ locationUid: 'LOCATION-1-1',
locationType: 'PARKING_ZONE',
parentLocationUid: 'LOCATION-1',
coordinatesType: 'GEO',
coordinates: '{LAT}:{LONG},{LAT}:{LONG},
{LAT}:{LONG},{LAT}:{LONG}',
name: '1ST-AVE-PARKING-SOUTH',
city: 'SPRINGFIELD',
state: 'ILLINOIS',
country: 'USA',
zipcode: '12345',
timezone: 'CDT',
properties: {
CD: 'X',
CCD: 'Y' },
address: null,
analyticCategory: {} }

locationType TRAFFIC_LANE

{ locationUid: 'LOCATION-2-1',
locationType: 'TRAFFIC_LANE',
parentLocationUid: 'LOCATION-2',
coordinatesType: 'GEO',
coordinates: '{LAT1}:{LONG1},{LAT2}:{LONG2}',
name: '1ST-AVE',
city: 'SPRINGFIELD',
state: 'ILLINOIS',
country: 'USA',
zipcode: '12345',
timezone: 'CDT',
properties: {
CD: 'X',
CCD: 'Y' },
address: null,
analyticCategory: {} }

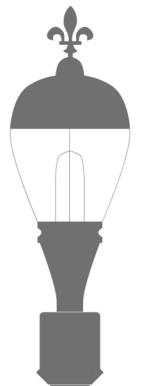
locationType WALKWAY

{ locationUid: 'LOCATION-3-1',
locationType: 'WALKWAY',
parentLocationUid: 'LOCATION-3',
coordinatesType: 'GEO',
coordinates: '{LAT3}:{LONG3},{LAT4}:{LONG4}',
name: '1ST-AVE-WALKWAY-SOUTH',
city: 'SPRINGFIELD',
state: 'ILLINOIS',
country: 'USA',
zipcode: '12345',
timezone: 'CDT',
properties: {
CD: 'X',
CCD: 'Y' },
address: null,
analyticCategory: {} }



CityIQ API Version 1.0





**assetType
NODE**

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```



**assetType
CAMERA**

```
{ assetUid: 'CAM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'PKOUT', 'PKIN', 'TFEVT', 'PEDEVT' ],
  mediaType: 'IMAGE,VIDEO',
  assetType: 'CAMERA',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {
    HOMOGRAPHY: 'x,x,x,x,x,x,x,x',
    CENTER_GEO_COORDINATE: '{LAT}:{LONG}',
    IMAGE_SIZE: 'X:Y',
    VIEW: 'X' } }
```

CityIQ Parking Planning API

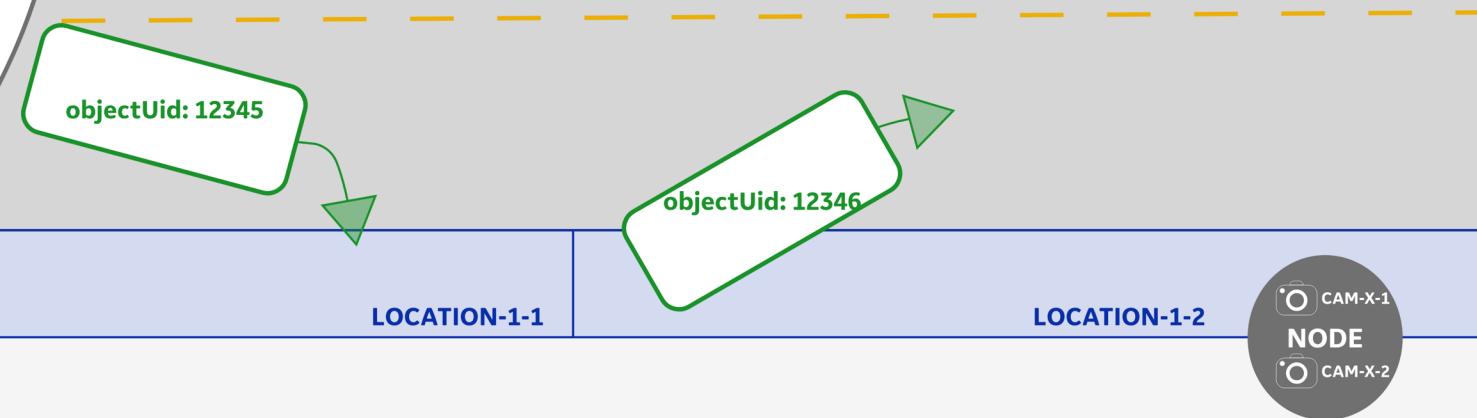
The Parking API uses the camera asset and performs CityIQ Analytics on the node and returns Parking In (PKIN) and Parking Out (PKOUT) events



Sample Responses are described here in json. Please note, the Parking Predix Zone ID is a necessary header input to access this API.

json responses in blue are obtained using the metadata service url

json responses in green are obtained using the events service url



locationType PARKING_ZONE

```
{ locationUid: 'LOCATION-1-1',
  locationType: 'PARKING_ZONE',
  parentLocationUid: 'LOCATION-1',
  coordinatesType: 'GEO',
  coordinates: '{LAT}:{LONG},{LAT}:{LONG},{LAT}:{LONG},{LAT}:{LONG}',
  name: '1ST-AVE-PARKING-SOUTH',
  city: 'SPRINGFIELD',
  state: 'ILLINOIS',
  country: 'USA',
  zipcode: '12345',
  timezone: 'CDT',
  properties: {
    CD: 'X',
    CCD: 'Y',
    address: null,
    analyticCategory: {} } }
```

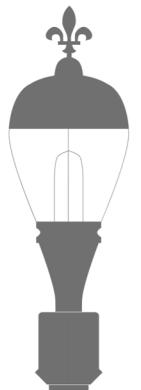
eventType PKIN

```
{ locationUid: 'LOCATION-1-1',
  assetUid: 'CAM-X',
  eventType: 'PKIN',
  timestamp: 1539090000000,
  properties: {
    orgPixelCoordinates: 'X:Y,X:Y,X:Y,X:Y',
    pixelCoordinates: 'A:B,A:B,A:B,A:B',
    objectUid: '12345',
    geoCoordinates: '{LAT}:{LONG},{LAT}:{LONG}',
    imageAssetUid: 'CAM-X',
    measures: {} } }
```

eventType PKOUT

```
{ locationUid: 'LOCATION-1-2',
  assetUid: 'CAM-X',
  eventType: 'PKOUT',
  timestamp: 1539090011000,
  properties: {
    orgPixelCoordinates: 'X:Y,X:Y,X:Y,X:Y',
    pixelCoordinates: 'A:B,A:B,A:B,A:B',
    objectUid: '12346',
    geoCoordinates: '{LAT}:{LONG},{LAT}:{LONG}',
    imageAssetUid: 'CAM-X',
    measures: {} } }
```





assetType NODE

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```



assetType CAMERA

```
{ assetUid: 'CAM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'PKOUT', 'PKIN', 'TFEVT', 'PEDEVT' ],
  mediaType: 'IMAGE,VIDEO',
  assetType: 'CAMERA',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {
    HOMOGRAPHY: 'x,x,x,x,x,x,x',
    CENTER_GEO_COORDINATE: '{LAT}:{LONG}',
    IMAGE_SIZE: 'X:Y',
    VIEW: 'X' } }
```

locationType WALKWAY

```
{ locationUid: 'LOCATION-3-1',
  locationType: 'WALKWAY',
  parentLocationUid: 'LOCATION-3',
  coordinatesType: 'GEO',
  coordinates: '{LAT1}:{LONG1},{LAT2}:{LONG2}',
  name: '1ST-AVE-WALKWAY-SOUTH',
  city: 'SPRINGFIELD',
  state: 'ILLINOIS',
  country: 'USA',
  zipcode: '12345',
  timezone: 'CDT',
  properties: {
    CD: 'X',
    CCD: 'Y' },
  address: null,
  analyticCategory: {} }
```

eventType PEDEVT

```
{ locationUid: 'LOCATION-3-1',
  assetUid: 'CAM-X-1',
  eventType: 'PEDEVT',
  timestamp: 1539090011000,
  properties: {
    directionUnit: 'DEGREE',
    speedUnit: 'METERS_PER_SEC',
    eventUid: 'ABC123' },
  measures: {
    counter_direction_speed: '0',
    counter_direction_pedestrianCount: '0',
    pedestrianCount: '1',
    counter_direction: '180',
    speed: '0.6',
    direction: '180' } }
```

CityIQ Pedestrian Planning API

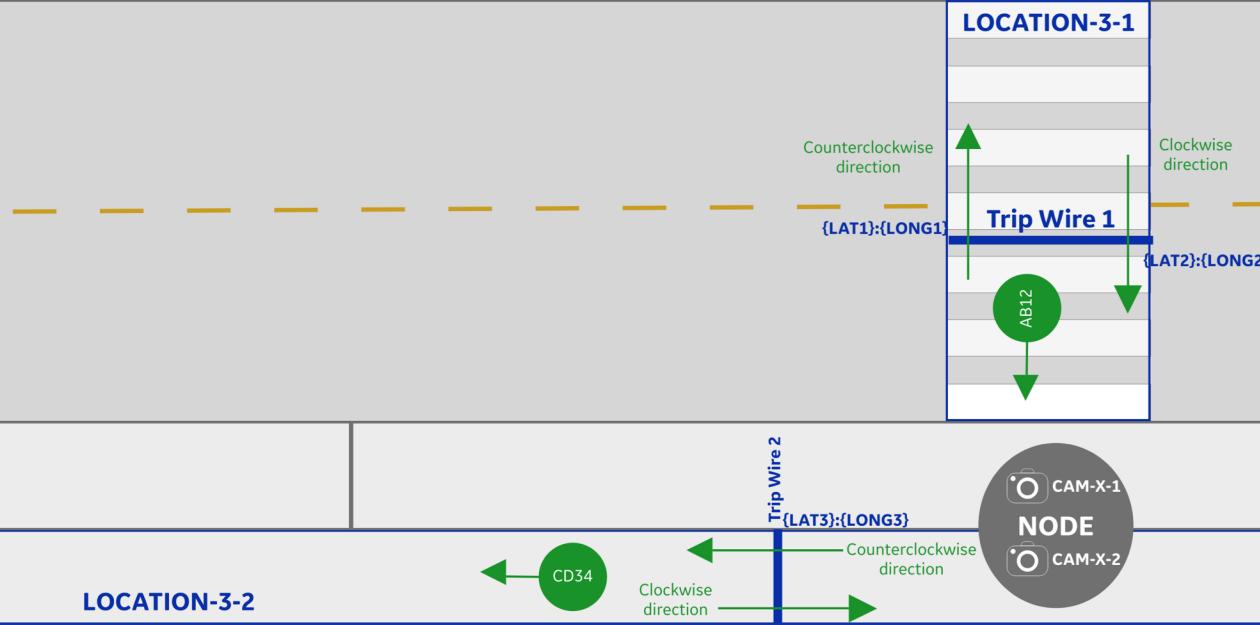
The Pedestrian API uses the camera asset and performs CityIQ Analytics on the node to return Pedestrian Events (PEDEVT)



Sample Responses are described here in json. Please note, the Pedestrian Predix Zone ID is a necessary header input to access this API.

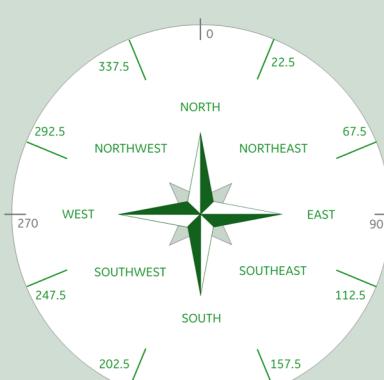
json responses in blue are obtained using the metadata service url

json responses in green are obtained using the events service url



eventType PEDEVT

```
{ locationUid: 'LOCATION-3-2',
  assetUid: 'CAM-X-2',
  eventType: 'PEDEVT',
  timestamp: 1539090011000,
  properties: {
    directionUnit: 'DEGREE',
    speedUnit: 'METERS_PER_SEC',
    eventUid: 'CD34' },
  measures: {
    counter_direction_speed: '0.5',
    counter_direction_pedestrianCount: '1',
    pedestrianCount: '1',
    counter_direction: '270',
    speed: '0',
    direction: '90' } }
```





CityIQ Traffic Planning API

The Traffic API uses the camera asset and performs CityIQ Analytics on the node to return Traffic Events (TFEVT) which register vehicles passing the tripwire in blue.

assetType NODE

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```

assetType CAMERA

```
{ assetUid: 'CAM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'PKOUT', 'PKIN', 'TFEVT', 'PEDEVT' ],
  mediaType: 'IMAGE,VIDEO',
  assetType: 'CAMERA',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {
    HOMOGRAPHY: 'x,x,x,x,x,x,x,x',
    CENTER_GEO_COORDINATE: '{LAT}:{LONG}',
    IMAGE_SIZE: 'X:Y',
    VIEW: 'X' } }
```

Sample Responses are described here in json. Please note, the Traffic Predix Zone ID is a necessary header input to access this API.

json responses in blue are obtained using the metadata service url

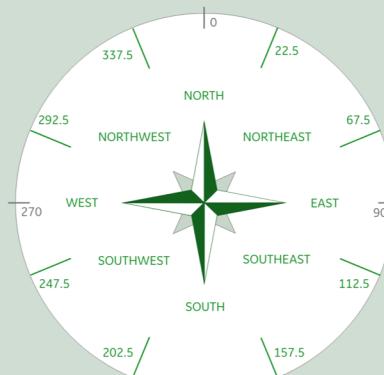
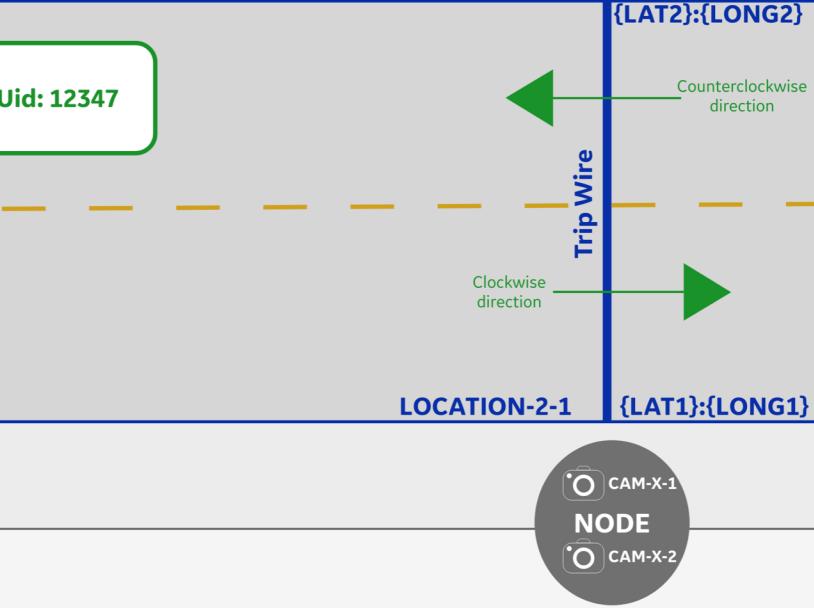
json responses in green are obtained using the events service url

locationType TRAFFIC_LANE

```
{ locationUid: 'LOCATION-2-1',
  locationType: 'TRAFFIC_LANE',
  parentLocationUid: 'LOCATION-2',
  coordinatesType: 'GEO',
  coordinates: '{LAT1}:{LONG1},{LAT2}:{LONG2}',
  name: '1ST-AVE',
  city: 'SPRINGFIELD',
  state: 'ILLINOIS',
  country: 'USA',
  zipcode: '12345',
  timezone: 'CDT',
  properties: {
    CD: 'X',
    CCD: 'Y' },
  address: null,
  analyticCategory: {
    TFEVT: "TRAFFIC_FLOW" } }
```

eventType TFEVT

```
{ locationUid: 'LOCATION-2-1',
  assetUid: 'CAM-X',
  eventType: 'TFEVT',
  timestamp: 1539090011000,
  properties: {
    speedUnit: 'METERS_PER_SEC',
    eventUid: '12347',
    directionUnit: 'DEGREE',
    counter_direction_vehicleType: 'vehicle',
    vehicleType: "" },
  measures: {
    counter_direction: "270",
    counter_direction_speed : "20",
    counter_direction_vehicleCount: '1',
    direction: "90",
    speed: "0",
    vehicleCount: "1" } }
```





CityIQ Bicycle Planning API

The Bicycle API uses the camera asset and performs CityIQ Analytics on the node to return Bicycle Events (BICYCLE) which register vehicles passing the tripwire in blue.

assetType NODE

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```

assetType CAMERA

```
{ assetUid: 'CAM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'PKOUT', 'PKIN', 'BICYCLE', 'PEDEVT' ],
  mediaType: 'IMAGE,VIDEO',
  assetType: 'CAMERA',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {
    HOMOGRAPHY: 'x,x,x,x,x,x,x',
    CENTER_GEO_COORDINATE: '{LAT}:{LONG}',
    IMAGE_SIZE: 'X:Y',
    VIEW: 'X' } }
```

Sample Responses are described here in json. Please note, the Bicycle Predix Zone ID is a necessary header input to access this API.

json responses in blue are obtained using the metadata service url

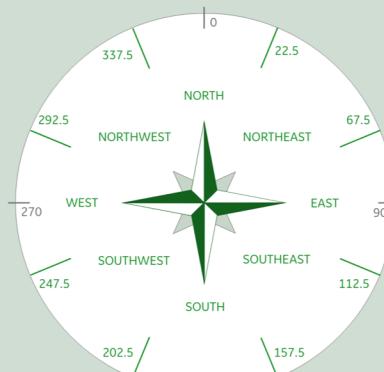
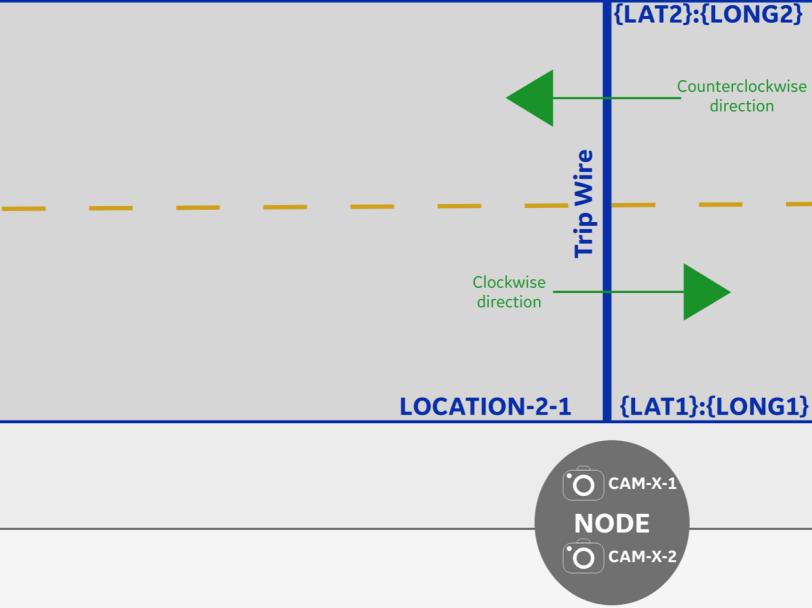
json responses in green are obtained using the events service url

locationType TRAFFIC_LANE

```
{ locationUid: 'LOCATION-2-1',
  locationType: 'TRAFFIC_LANE',
  parentLocationUid: 'LOCATION-2',
  coordinatesType: 'GEO',
  coordinates: '{LAT1}:{LONG1},{LAT2}:{LONG2}',
  name: '1ST-AVE',
  city: 'SPRINGFIELD',
  state: 'ILLINOIS',
  country: 'USA',
  zipcode: '12345',
  timezone: 'CDT',
  properties: {
    CD: 'X',
    CCD: 'Y' },
  address: null,
  analyticCategory: {} }
```

eventType BICYCLE

```
{ locationUid: 'LOCATION-2-1',
  assetUid: 'CAM-X',
  eventType: 'BICYCLE',
  timestamp: 1539090011000,
  properties: {
    speedUnit: 'METERS_PER_SEC',
    eventUid: '12356',
    directionUnit: 'DEGREE' },
  measures: {
    bicycleCount: 0,
    counter_direction: "270",
    counter_direction_speed : "5",
    counter_direction_bicycleCount: '1',
    direction: "90",
    speed: "0" } }
```





assetType
NODE

```
{assetUid: 'NODE-X',
parentAssetUid: null,
eventTypes: [ 'HEALTH_REPORT' ],
mediaType: null,
assetType: 'NODE',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {} }
```

((•))
assetType
ENV_SENSOR

```
{assetUid: 'ENV-X',
parentAssetUid: 'NODE-X',
eventTypes: [ 'TEMPERATURE',
'HUMIDITY',
'PRESSURE' ],
mediaType: '',
assetType: 'ENV_SENSOR',
coordinates: '{LAT}:{LONG}',
status: 'ONLINE',
properties: {} }
```

Sample Calculation for Temperature:
Temp in Celsius = $2880 \text{ K} * 10^{-1} - 273 = 15^\circ\text{C}$

CityIQ Environmental Planning API

The Environmental API uses the sensor assets and reports measurements periodically in the form of Temperature, Humidity, and Pressure events.

Sample Responses are described here in json. Please note, the Environmental Predix Zone ID is a necessary header input to access this API.

((•))

json responses in blue are obtained using the metadata service url

json responses in green are obtained using the events service url

eventType TEMPERATURE

```
{locationUid: 'ENV_NODE_LOCATION',
assetUid: 'ENV-X',
eventType: 'TEMPERATURE',
timestamp: 1539090011000,
properties: {
  unit: 'KELVIN',
  powerOf10: '-1' },
measures: {
  min: '2880',
  median: '2890',
  max: '2930',
  mean: '2900' } }
```



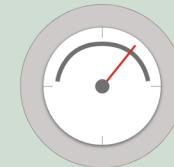
eventType HUMIDITY

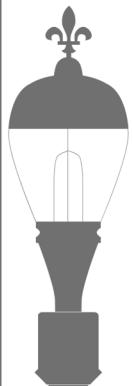
```
{locationUid: 'ENV_NODE_LOCATION',
assetUid: 'ENV-X',
eventType: 'HUMIDITY',
timestamp: 1539090011000,
properties: {
  unit: 'PERCENT',
  powerOf10: '-2' },
measures: {
  min: '5416',
  median: '5420',
  max: '5421',
  mean: '5419' } }
```



eventType PRESSURE

```
{locationUid: 'ENV_NODE_LOCATION',
assetUid: 'ENV-X',
eventType: 'PRESSURE',
timestamp: 1539090011000,
properties: {
  unit: 'PASCALS',
  powerOf10: '0' },
measures: {
  min: '100711',
  median: '100717',
  max: '100722',
  mean: '100717' } }
```





**assetType
NODE**

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```



**assetType
CAMERA**

```
{ assetUid: 'CAM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'PKOUT', 'PKIN', 'TFEVN', 'PEDEVN' ],
  mediaType: 'IMAGE,VIDEO',
  assetType: 'CAMERA',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {
    HOMOGRAPHY: 'x,x,x,x,x,x,x',
    CENTER_GEO_COORDINATE: '{LAT}:{LONG}',
    IMAGE_SIZE: 'X:Y',
    VIEW: 'X' } }
```

CityIQ Media API



The Media API allows users to access the Camera to return images and video clips. Different from the other APIs, the Media API uses the media service url and requires approval from your municipality to gain access.

Sample Responses are described here in json. Please note, the Image and Video Predix Zone IDs are necessary header inputs to access this API.

1. Query for the Image or Video by mediaURL and by node parameter

Response 1:

```
{ pollURL: 'https://{{pollURL-for-image-of-instance-and-camera-searched}}',
  noOfElements: 1 }
```

2. Query the pollURL to obtain the image/video

<https://{{pollURL-for-image-of-instance-and-camera-searched}}>

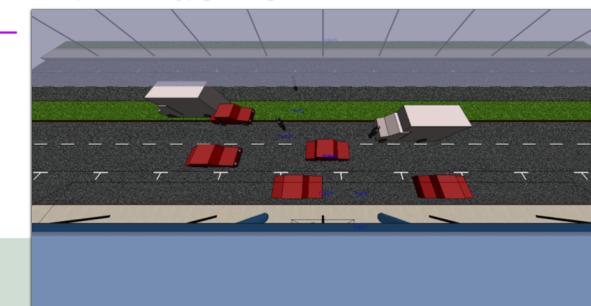
Response 2:

```
{ status: "SUCCESS",
  listOfEntries: { "content": [
    { mediaLogId: 13,
      mediaUUID: "GRC-NODE",
      mediaType: "IMAGE",
      mediaFileName: "CAMERA-X-1539090011000_IMAGE",
      mediaTimestamp: 1539090011000,
      assetUid: "CAM-X",
      externalRefId: "CAM-X",
      entryTimestamp: 1539010011000,
      url: "https://{{media-service-url}}/CAM-X-1539090011000_IMAGE.jpg" },
    { mediaLogId: 14,
      mediaUUID: "GRC-NODE",
      mediaType: "IMAGE",
      mediaFileName: "CAMERA-X-1539090011000_IMAGE",
      mediaTimestamp: 1539090011000,
      assetUid: "CAM-X",
      externalRefId: "CAM-X",
      entryTimestamp: 1539010011000,
      url: "https://{{media-service-url}}/CAM-X-1539090011000_IMAGE.jpg" }
  ],
  last: true,
  totalPages: 1,
  totalElements: 1,
  first: true,
  numberOfElements: 1,
  sort: [
    { direction: "DESC",
      property: "mediaLogId",
      ignoreCase: false,
      nullHandling: "NATIVE",
      ascending: false },
    { size: 100,
      number: 0 } ] }
```

3. Query the response URL to save the image/video

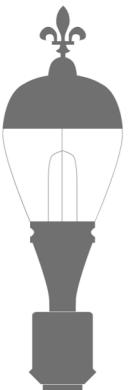
https://{{media-service-url}}/CAM-X-1539090011000_IMAGE.jpg

Response 3: jpg Image



json responses in blue are obtained using the metadata service url

json responses in red are obtained using the media service url



assetType
NODE

((.))

assetType
EM_SENSOR

```
{ assetUid: 'NODE-X',
  parentAssetUid: null,
  eventTypes: [ 'HEALTH_REPORT' ],
  mediaType: null,
  assetType: 'NODE',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```

```
{ assetUid: 'EM-X',
  parentAssetUid: 'NODE-X',
  eventTypes: [ 'METROLOGY',
    'ENERGY_ALERT',
    'ENERGY_TIMESERIES' ],
  mediaType: null,
  assetType: 'EM_SENSOR',
  coordinates: '{LAT}:{LONG}',
  status: 'ONLINE',
  properties: {} }
```

Sample Calculation for voltage:
max voltage = $124459109 * 10^{-6} = 124.5 \text{ V}$

CityIQ Energy Metering API

The Energy Metering API uses the energy metering (em) sensor assets and reports measurements at time intervals specified by the municipality. There are two types of events, Metrology and Timeseries. Metrology being the energy data at the input to the node reflecting energy consumption and Timeseries being the total energy consumption (Wh) of each individual node since installation.

Sample Responses are described here in json. Please note, the Energy Metering Predix Zone ID is a necessary header input to access this API.

((.))

json responses in blue are obtained
using the metadata service url

json responses in green are obtained
using the events service url

eventType METROLOGY

```
{
  "locationUid": "METERING_LOCATION",
  "assetUid": "EM-X",
  "eventType": "METROLOGY",
  "timestamp": 1536881157891,
  "properties": {
    "powerOf10_energy": "-12",
    "powerOf10_power_factor": "-6",
    "powerOf10_voltage": "-6",
    "powerOf10_current": "-6",
    "powerOf10_power": "-6"
  },
  "measures": {
    "average_power_factor": -794104,
    "min_power_factor": -888546,
    "max_power_factor": -694021,
    "max_voltage": 124459109,
    "average_current": 166368,
    "average_power": 17823727,
    "energy_instantaneous": 0,
    "min_current": 144135,
    "max_power": 19665141,
    "min_voltage": 123885861,
    "average_voltage": 124179430,
    "max_current": 189146,
    "energy_cummulative": 1586769888568217600,
    "min_power": 16355081
  }
}
```

eventType TIMESERIES

```
{
  "locationUid": "METERING_LOCATION",
  "assetUid": "EM-X",
  "eventType": "ENERGY_TIMESERIES",
  "timestamp": 1536881387000,
  "properties": {
    "unit": "0.1Wh"
  },
  "measures": {
    "value": 15868315
  }
}
```