Alley Infrastructure Inventory Toolkit

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CONTENTS

1. SEATTLE ALLEY INFRASTRUCTURE INVENTORY PROJECT SYNOPSIS

Seattle is widely thought to be the first city in the U.S. and the E.U. to comprehensively map the Center City area's commercial vehicle load/unload space network, including its alleys. The data methods in this toolkit were designed and used to create a complete GIS database of the 417 alleys in Seattle's Center City area, mapping the alley network's geospatial location and documenting physical (truck-related) attributes measurements of alleys' key. These attributes directly impact alley operations and functionality.

SDOT and the research team purposefully chose which truck-related features to include in the alley inventory after consulting with both UFL members who deliver goods (such as UPS and USPS) and with other city agencies (such as police, fire, and public utilities) that regularly use alleys. For security purposes, the police need to know where alley entrances to buildings are located; the fire department must navigate large trucks through alleys; and utility infrastructure is frequently located in alleys.

As cities grow denser and more congested, the mix of competing alley users grows. Traditional box and parcel delivery trucks, vans and service vans who use alleys as the back door to buildings jockey for space with ride-share services like Lyft and Uber and passenger cars queuing in alleys to use off-street garages. Reports of conflicts and concerns about potential future conflicts (should alleys be inadequately managed to meet demand) are on the rise. To mitigate congestion, many cities face a growing need to actively manage their load/unload network. An alley survey is a key part of this process, helping policymakers and transportation officials understand how alley features impact the way a city's alley system works at street level.

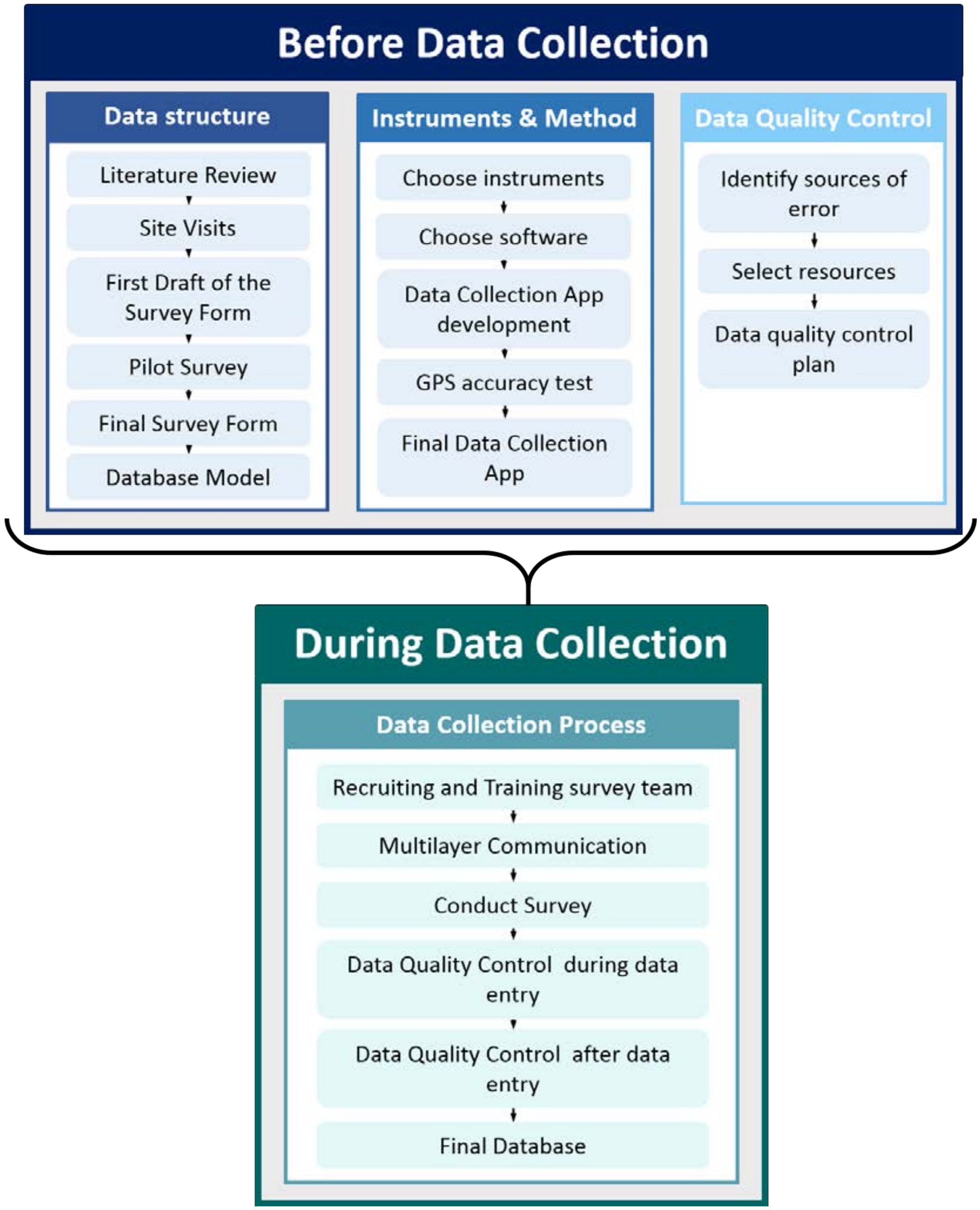
2. STUDY GOALS

To build an accurate GIS map of the Center City area alley network's geospatial location and an accurate inventory of measurements of alleys' key physical (truck-related) attributes using methods that are:

- Replicable;
- Available at reasonable cost;
- Ground-truthed;
- Governed by quality-control measures in each step.

An alley inventory, as outlined here, can help cities actively manage their alleys as part of the comprehensive load/unload network (which includes private loading bays/docks and curb space).

3. METHOD OVERVIEW AND STEP-BY-STEP PROCESS TO CONDUCT AN ALLEY INVENTORY



Step 1: Determine study parameters

Based on project scope and budget, determine at the outset the:

- Scope/size of desired study area.
- Number of alleys to inventory. Use pre-existing GIS databases, like transportation network. If no database or no alleys in the database, estimate using the number of city blocks in the study area.
- Data-collection hours. Daylight hours only recommended for security reasons. Low-activity periods (e.g. weekends) are acceptable.

Seattle project at a glance:

- Study area: 941 city blocks
- Data-collection period: Three weeks, January 2018
- Workforce: 32 data collectors and 3 supervisors
- Total person-hours to examine and collect data on the 417 Center City area alleys: 850

Step 2: Define alley attributes of interest with broad range of agencies

The inventory can have broad applications beyond urban freight. Seattle involved agencies such as police, public utilities, and fire agencies, as well as urban freight firms to define the features to map and survey related to alley aspects below.

1. Connectivity to street network, including:

- Name of streets that the alley connects to
- Street name or number
- Whether the alley is off a one-way or two-way street
- Whether the alley is one-way or two-way traffic
- Direction of one-way alleys

2. Design, including:

- End points (**width** and **height** with measures recorded as smallest width and height within 30' from the alley entrance in order to capture most cargo vans' and trucks' bumper-to-bumper length)
- Aprons (width, length, and cross slope; slope determines if fully-loaded handcarts can maneuver)
- Interiors (end-to-end alley length, type of pavement surface, narrowest point; and fixed overhead or on-the-ground obstructions)

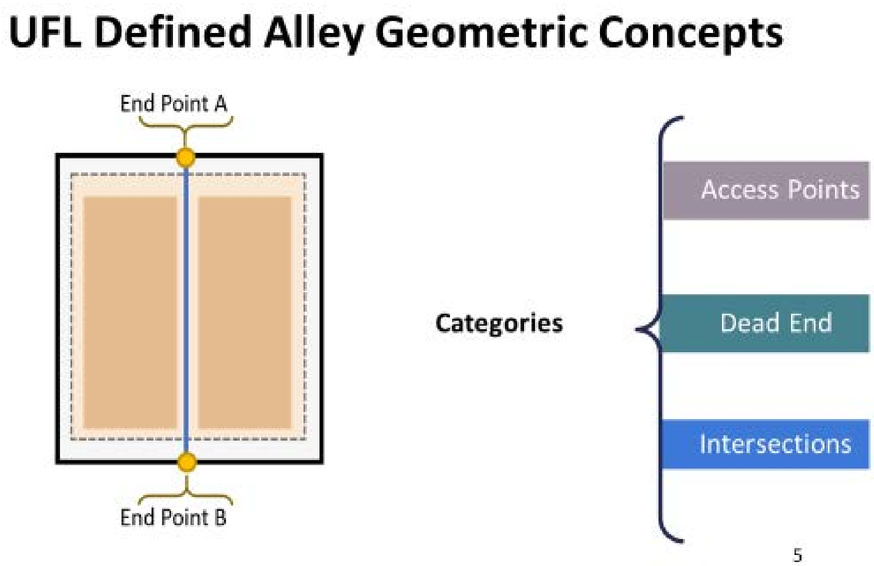
3. Accessibility, including:

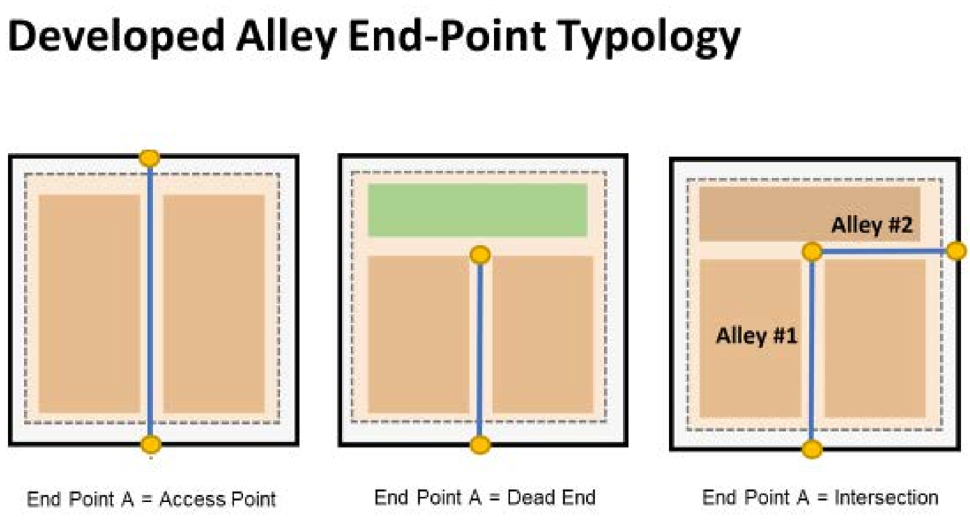
- Driveways connected to the alleys
- Location of buildings' main entrances
- Restrictions on alley usage as shown on posted signs
- Loading bay entrances
- Passenger parking, if visible or signed
- Presence of furniture or equipment
- Number of garbage containers

4. Pavement condition, based on qualitative assessment of "Good" or "Poor" for delivery people who walk alleys with loaded handcarts.

Step 3: Use Urban Freight Lab's detailed alley typology to categorize significant alley features

UFL researchers could not find an existing classification system for alleys, so, they built one. This typology has broad applications for cities and researchers. It allows data collectors in-field to identify alleys with a uniform set of measures. Every alley has two end points and fits one of three categories, shown below at right.





Step 4: Select data-collection tools

The UFL research team created what is thought to be a first-of-its-kind mobile-app-based data-collection instrument. The app has these advantages over a paper-based survey:

- **Efficient**: Allowing automation of data digitization and photo collection and storage
- **Flexible**: Permitting form revision if surveyors encounter unforeseen infrastructure conditions that require a new data structure
- **Fast**: Offering speedy data input in field with automated questions and drop-list answers
- **Reasonably priced**: Providing an asset that operates within project budget constraints
- **Accurate**: Enabling reduction of transcript errors and data lost in transit
- **Data quality controlled**: Providing almost real-time data-collection monitoring and spatial visualization of completed surveys

The map-based app allowed for manual GPS coordinate reading by dropping a location pin, creating an up-to-date geodatabase with detailed alley features, with alleys represented as a point feature on the GIS map. The app allowed manual input of the infrastructure location supported by offline basemaps, enabling teams to avoid wireless Internet plan cost for the tablets in data collection. A hard-copy paper questionnaire may be a viable alternative if a mobile app is not practical.

UFL project tools used with unit price.

Instrument name	Unit price ($)
Laser measuring device	80
Measuring wheel	50
iPad mini 2 with 32 GB and Wi-Fi and cellular option*	300
Portable power bank	11
iPad Case	90
Security Vest	17.9
Clipboard	2

*This instrument may not be required if the survey instrument is paper-based

Step 5: Choose software and program data-collection app

Select database management software that allows for:

- Controlled submission or input of data
- Data storage in different formats, including databases with relationships, geodatabases and cloud storage
- Multiuser data editing
- Set data rules and relationships
- Secure data
- Data-collection app

These allow effective data management, data quality control and scale-up of data collection with multiple staff.

Using ESRI GIS software Survey123, ArcView and ArcGIS Online for the survey form and data-collection process on tablets allows for seamless visualization of the collected data and its editing. Survey123 allows selection of the most appropriate basemap to assist the geolocation input. An appropriate basemap can be created incorporating various elements as needed/available in a given city.

In Seattle, researchers chose the World Street basemap (from ArcGis.com viewer last updated July 2017) preloaded within ArcGIS software. Researchers added existing GIS data of the location and key names of alleys and loading bays in Seattle's Center City area from government databases and others.

Step 6: Draft and pilot field survey

The field survey should include the key alley attributes identified in Step 2. UFL researchers field-tested the draft survey with six alleys, located inside a 3x3 city block area, allowing them to:

- Estimate the time needed to survey each alley, including walking time between alleys.
- Identify potential problems with the survey logic, such as how survey questions can be adapted to avoid losing valuable data if an alley interior is blocked or security concerns prevent collectors from entry. (Alley inventory survey demonstrates these adaptations.)
- Test data-collection methods and instruments.

Step 7: Use pilot learning to create final survey, data structure, metadata and data quality-control plan

Identify and create a plan to prevent three common error types in this project type:

1. **Positional error**: inaccuracies in GPS coordinate readings due to device issues (e.g. low satellite signal in urban canyons) and human error in manually collecting data on tablets
2. **Attribute error**: associated with non-spatial alley data collected (e.g. incorrect data entry due to wrong measurements or mistyped data; lack of access to needed data due to obstructions or safety issues)
3. **Conceptual error**: around identification/classification of alley attributes or related information.

Follow quality-control protocols before data collection, during data entry, and after data entry that involve supervisors, data collectors in field, and related technologies and inventory survey app (programmed to limit data-entry inaccuracies.)

Define roles and respective quality-control responsibilities.

Supervisor(s) define/enforce data-collection standards and methodology; train data collectors; monitor/ maintain database and handle data-control measures before data collection/after data entry.

Collectors enter data in field and run same-day data quality-control checks after data entry.

Survey app digital and online tool creates entry constraints/eases digitization as data are collected.

Step 8: Recruit and train data collectors

Recruiting: Project budget; timeline; survey length/complexity; security concerns; time needed for in-field collection, including commute time to/within study area, and in-office quality-control determine number of data collectors and supervisors needed. Deploying collectors in teams of two improves security and enables efficient operation of data-collection instruments (e.g. laser measurement device, measuring wheel, iPad, etc.)

Training: At least three distinct data-collector training sessions are suggested, with first and third done in classroom-type setting and second done in field.

1. **First session:** Covers alley concepts, attributes, project overview, shift information and security/safety.
2. **Second session:** Covers practical aspects of data collection such as how to: use questionnaire in tablet app; take accurate measurements with the laser and wheel devices; effectively divide collection work between the two collectors; use hard-copy maps that divide study area into sectors; follow safety/security protocol.
3. **Third session:** Covers how to access survey data results and properly clean data after each field shift.

Step 9: Collect data

Ensure territory assignments formed, hard-copy maps printed for each team/shift.

Develop check-out/check-in process for collectors' needed shift materials.

Form work shifts around geographic area depending on collectors' schedules and shift lengths.

Instruct collectors to work in teams of 2 and search every city block for alleys, even if local basemaps do not show alley.

Instruct collectors to conduct a check of the surveyed alley locations after in-field collection to make more efficient final cleaning of the complete dataset.

Establish comprehensive security protocol and multilayer communications plan for all interested parties to avoid unsafe situations in field, including instructing data collectors to:

- not enter alley if uncomfortable, including due to vehicles obstructing alley access
- exit alley at any point if uncomfortable while collecting features (per Step 6, survey logic can accommodate interruptions so at minimum data can be collected from either end of alley)
- always carry official documents from sponsoring agency (including agency official contact information) explaining project and granting data-collection authorization.

Recruit and inform police and other relevant agencies to help communicate with all building managers in the survey area.

- In Seattle, police notified all survey area building managers in real time where/when collectors were working via pre-existing information exchange for building operators and the police.
- Seattle Department of Transportation webpage communicated to public and stakeholders where and when data collectors were working.

Step 10: Clean, assemble and summarize data

Conduct comprehensive data clean.

Assemble data in final format that best meets city and/or researcher needs.

Seattle format included these features:

- Alleys displayed and mapped in GIS software, considered as point feature layer of alley reference end points
- Corresponding attribute table stored most alley information
- Table attachments with one-to-many relationship with alley reference end points layer stored information on passenger parking, driveways, buildings' main entrances, and narrowest points along alley.
- JPEG files with a naming convention allowed stored photos of alley features to easily link to the corresponding alleys

4. KEY TAKEAWAYS FROM THE SEATTLE ALLEY INFRASTRUCTURE STUDY

Cities that want to strategically manage their load/unload space network can use the toolkit to replicate the pioneering UFL alley survey and generate much-needed data and findings to inform policy and practice.

The Seattle alley infrastructure inventory and occupancy study produces several key findings that give policymakers and transportation officials new understanding of the Seattle Center City area alley system and how the system can best be managed to avoid massive gridlock. Among those findings are that:

- More than 90% of Center City area alleys are only one-lane wide. This creates an upper limit on alley parking capacity, as each alley can functionally hold only one or two vehicles at a time.
- When informed by the second key finding—68% of vehicles in the alley occupancy study parked there for 15 minutes or less—it becomes clear that moving vehicles through alleys in short time increments is the only reasonable path to increase productivity.

As one parked vehicle operationally blocks the entire alley, the Urban Freight Lab team concludes that the goal of new alley policies and strategies should be to reduce the amount of time alleys are blocked to additional users. Adding to street congestion and pollution by pushing commercial vehicles onto surface streets to circle until an alley is free is an undesirable outcome. Rapid changes in the city's built environment call for regularly updated alley surveys, such as every five years.

5. SUPPORTING MATERIALS:

- Step-by-Step guide to conduct an alley infrastructure inventory study
- Alley inventory survey metadata
- Survey materials list
- Alley inventory survey training Power Point
- Data collector training Power Point
- Authorization letter for data collectors to carry in field

STEP-BY-STEP GUIDE TO CONDUCT AN ALLEY INFRASTUCTURE INVENTORY

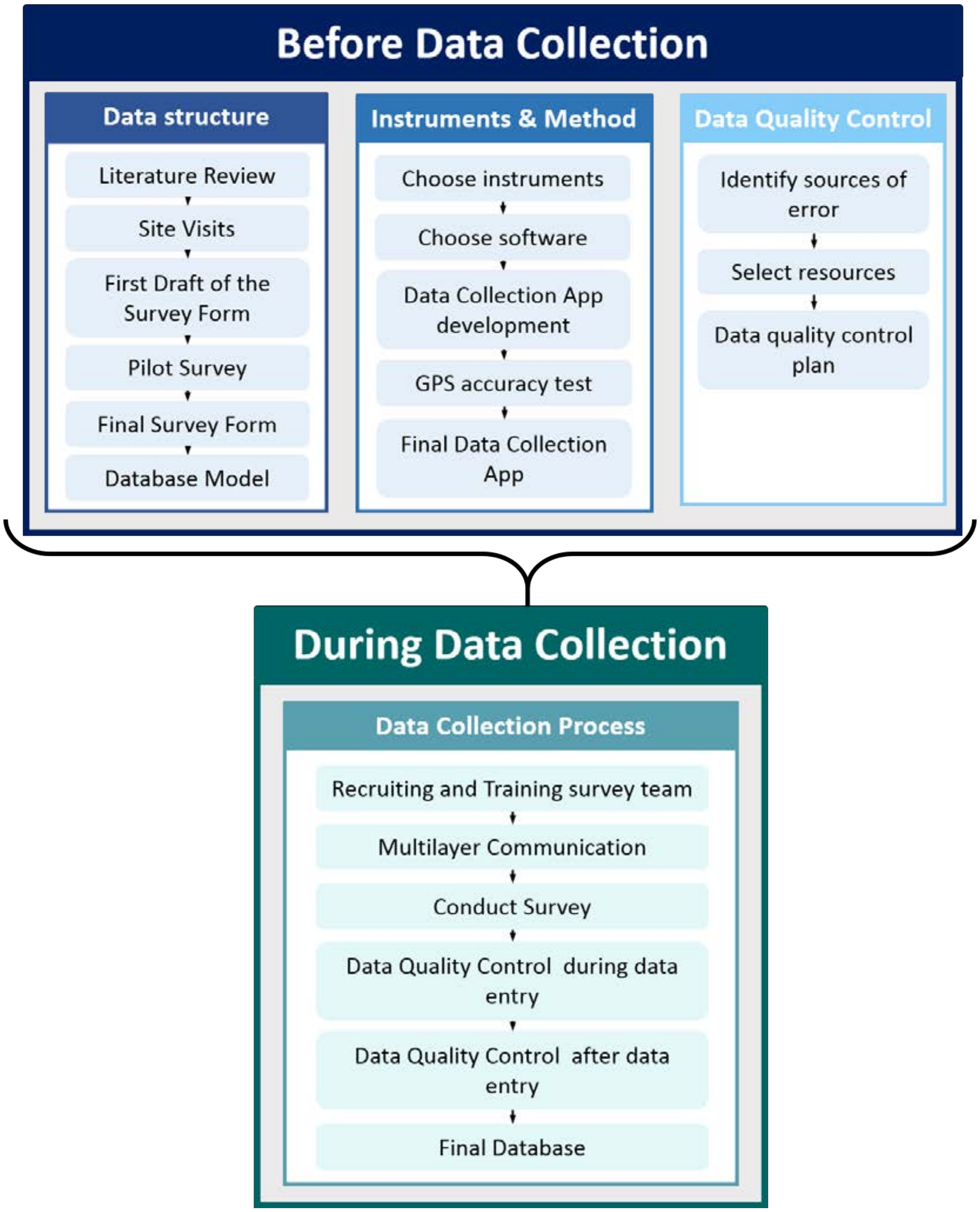
This toolkit describes the step-by-step process that city transportation professionals can follow to carry out an alley inventory survey.

The data-collection and analytic methods represented here are:

- Replicable;
- Available at reasonable cost;
- Ground-truthed;
- Governed by quality-control measures in each step.

The figure A1 below outlines the overall project data process.

Figure A1. Data Process.



STEP 1: DETERMINE STUDY PARAMETERS

The first step should define these key parameters:

Scope/size of desired study area

Number of alleys to inventory: Pre-existing GIS databases such as transportation network may be a valuable resource as these databases might include alleys. If there is a GIS database of the transportation network but it does not include alleys, the number of city blocks could also be used to assess the scope of the effort involved to complete data collection in the defined study area.

Data-collection hours: For security reasons, it is recommended to work only during daylight hours. As this is not an occupancy study, periods of low activity, such as weekend days, are also candidate times to collect alley data.

STEP 2: DEFINE ALLEY ATTRIBUTES OF INTEREST

Transportation officials should define the specific alley attributes the inventory effort seeks to capture. Cities should decide what agencies, beyond transportation, to include in the definition of attributes as the inventory can have broad applications beyond urban freight. As outlined in the Inventory Method Design, Seattle involved police, public utilities, and fire agencies, as well as firms involved in urban freight. Cities can use (and adapt as desired) the detailed alley typology in the Inventory Method Design to categorize significant alley features. Broadly, Seattle's effort sought to map and inventory various attributes related to 1) Alley connectivity to street network; 2) Alley design; 3) Alley accessibility; 4) Alley pavement condition. Details are available in the Inventory Method Design.

STEP 3: SELECT DATA-COLLECTION TOOLS

The UFL research team decided that a **mobile-app-based data-collection instrument** built from an off-the-shelf basemap was a better option than a paper-based instrument, as detailed in the Inventory Method Design. That said, a paper-based questionnaire may be a viable alternative if a mobile data-collection app is not available or practical.

It is recommended that the chosen tools of the data-collection method be:

- Able to measure metrics with sufficient accuracy
- Easy to transport
- Reasonably priced
- Available as off-the-shelf technology

Below is the list of tools used in the UFL project and their unit price.

INSTRUMENT NAME	UNIT PRICE ($)
Laser measuring device	80
Measuring wheel	50
iPad mini 2 with 32 GB and Wi-Fi and cellular option*	300
Portable power bank	11
iPad Case	90
Security Vest	17.9
Clipboard	2

*This instrument may not be required if the survey instrument is paper-based

STEP 4: CHOOSE SOFTWARE AND PROGRAM DATA-COLLECTION APP

This step requires choosing a database management software that allows for the following functionalities:

- Controlled submission or input of data
- Data storage in different formats, including databases with relationships, geodatabases and cloud storage
- Multiuser data editing
- Set data rules and relationships
- Secure data
- Data-collection app

These functionalities allow effective data management, data quality control and the scaling up of data collection with multiple staff members. It is also recommended to include a data-collection app for the collection of data in field to reduce transcript time and errors. The Urban Freight Lab effort included development of an alley inventory app, thought to be the first of its kind.

The research team implemented the survey form and data-collection process on tablets using ESRI GIS software Survey123, ArcView and ArcGIS Online. These ESRI products offer a seamless data-collection tool that not only allows for visualization of the collected data but its editing.

Additionally, Survey123 allows selection of the most appropriate basemap to assist the geolocation input.

The mobile data-collection app allows manual input of the infrastructure location supported by offline basemaps. This allowed the UFL research team to avoid the cost of having a wireless Internet plan for the tablets to support data collection. During development of the data-collection app, researchers tested the questionnaire in field and in office to prevent logic and other errors in using the survey form.

Based on the UFL research team experience, the collection of geolocation with off-the-shelf GPS devices in urban areas requires:

- Selection of a basemap to support the data collection
- Manual GPS coordinate reading by dropping a pin with a map-based app
- Definition of the data quality control regarding geolocation measures.

UFL researchers selected as a basemap the World Street from ArcGis.com viewer that was last updated on July of 2017 (3). An appropriate basemap can be created incorporating various elements as needed/available in a given city. In Seattle's case, UFL researchers first selected the World Street Map basemap preloaded within ArcGIS software and available from arcgis.com. This worldwide street map presents highway-level data for the world. To supplement this resource and make the basemap more specific within Seattle, researchers added existing GIS data of the location and key names of alleys and loading bays in Seattle's Center City area. The former was from King County's Metro Transportation Network (TNET) database, and the latter was from the SDOT-UW Final 50 Feet Loading Bays and Docks database.

STEP 5: PREPARE ALLEY INVENTORY SURVEY FORM

The survey should encompass all key attributes identified in Step 2. The specific scope of work for each project may require adaptation of the survey form used in this report. If changes are needed, the recommended process is to pilot-test the draft survey form as discussed in the Inventory Method Design section. This pilot test enables cities to:

- Estimate the time needed to survey each alley, including walking time between alleys
- Identify potential problems with the survey logic
- Test data-collection methods and instruments

This step should result in a survey form and metadata document that describe survey data structure.

STEP 6: CREATE DATA QUALITY-CONTROL PLAN

A data quality-control plan must consider the possible sources of error in the data and the resources available to mitigate these errors at different stages of the data-collection process. This helps ensure the quality of the data before it is collected, entered or analyzed. It also helps with monitoring and maintaining the data once collected. The UFL research team identified the types and possible sources of error specific to this type of project to define the quality-control measures needed:

Positional error refers to inaccuracies of GPS coordinate readings due to device issues (e.g. low satellite signal in urban canyons) and mistakes by humans manually collecting this data with tablets.

Attribute error is associated with the remaining non-spatial alley data collected with the survey. Some examples are incorrect data entry due to wrong measurements or mistyped data. Lack of access to the information due to obstructions or safety issues may also result in inaccurate data.

Conceptual error refers to errors around identification and classification of relevant alley attributes or related information. Concepts wrongly used can result in information misclassified and information not captured.

Figure A-2 below shows the UFL project data quality-control design to address the three types of errors above. Figure A-2 illustrates the measures implemented in three stages: before data collection, during data entry, and after data entry.

The Seattle project used three types of resources to carry out quality-control procedures throughout the three project stages:

Supervisor(s) are responsible for defining and enforcing data-collection standards and methodology; training the data collectors; and monitoring and maintaining the database. The supervisor handled the data-control measures implemented before data collection and after data entry.

Collectors are responsible for data entry in field and carrying out same-day data quality-control checks after data entry.

Survey app refers to the digital and online tool that helps create entry constraints, eases the digitization of the data as it is collected and ends the need for manual information digitalization. The survey app plays an important quality-control role because it is programmed to limit inaccuracies in the data-entry stage by considering the data structure rules, attributes and relationships.

Figure A-2. UFL Data Quality-Control Process

	STAGE 1. BEFORE COLLECTION		STAGE 2. DURING DATA ENTRY		STAGE 3. AFTER DATA ENTRY	
	In office	**In field**	**In field**		**In office**	
	Supervisor(s)		Collector(s)	Survey App	Collector(s)	Supervisor(s)
Positional	Establish physical reference of geopoints	Deliver training session to collectors about GPS location collection with survey app	Instructed to be always aware of their location Keep track of surveyed alley locations with hard copies of maps	Includes manual collection of GPS reading by dropping location pin Includes updated base map with city blocks, building outlines, King County TNET alleys and loading bays in alleys.	Conduct same-day check of surveyed alley locations by reviewing alley end points in ArcGIS Online Check street names of alley end points Check alley TNET id the alley exist in King County's TNET database	Check alleys in TNET database to identify alleys not visited (i.e. missed)
Attributes (Infrastructure features)	Build questionaries' data entry constrains in survey app Deliver theoretical training session to data collector	Deliver training session on data collection with survey app and measurement devices regarding infrastructure features	Take clear photos to aid data entries	Includes visual and written aid for data fields	Conduct same-day check of data collected in field using ArcGIS Online platform	Check numeric fields for outliers Conduct revisits to missing alley locations
Conceptual (Infrastructure concepts)	Establish metadata and vocabulary related to the surveyed infrastructure Deliver theoretical training session to data collector	Train collectors in field on how to identify infrastructure relevant to the survey	Write open-ended comments, take additional pictures and use "Other" categories for "undefined" cases	NA = Not applicable	NA = Not applicable	Resolve collectors' observations Check classification of alley end point types with pictures collected and basemap in ArcGIS Online

STEP 7: RECRUITING AND TRAINING OF DATA COLLECTORS

Recruiting

The workforce requirements (number of data collectors and supervisors needed) are determined by the project budget, timeline and survey length. Security concerns and survey complexity may also result in different workforce needs. For instance, data collectors may work better in teams of two to improve security conditions and enable efficient operation of the multiple data-collection instruments (e.g. laser measurement device, measuring wheel, iPad, etc.).

Beyond the time required for data collection in-field, project organizers should also account for the time needed for data-collection staff to commute to/from the study area and conduct data quality-control tasks in office. These tasks will take a varying amount of time depending on the nature, size and location of the study area, and are important to consider when estimating workforce needs in relation to the desired project duration.

Training

Three different data-collector training sessions are suggested:

The first session instructs data collectors in alley concepts and attributes. This training session can be done in a classroom-type setting, with a slide presentation introducing the audience to alleys and the various features and concepts that surround them. The research project should be explained, providing everyone with the goal, process, timeline, and information on shifts. This is also where data collector security and safety protocols can be covered. (See Step 8.)

The second session focuses on practical aspects of data collection, such as how to use the questionnaire in the tablet app and the measurement tools. This training session can be done in-field to give the collectors real-world practice with the materials and process.

The materials needed for alley inventory data collection are detailed in Appendix B. These materials should be acquired before the second training session. Enough should be purchased so every collector and collector pair has what they need. Maps should be prepared that divide up the study area into sectors, allowing data collectors to always have a hard copy map to reference in-field.

This training session should lead the collectors through the actual process of collecting data. Attention should be paid to teaching how to take accurate measurements with the laser and wheel devices and how to effectively divide the collection work between the pair. One person may become very familiar with the measurement tools and always take measurements; the other may become adept at navigating and filling in the survey tool and always take responsibility for this task. Data collectors also had a chance to practice security and safety protocol in field, such as pausing to look down the alley length and determining whether they felt safe before entering. (See Step 8.)

The third session centers on how to implement data quality-control measures. After every shift in-field, one of the data collectors in each pair must clean the data he or she just collected. The third training session should be dedicated to this data-cleaning process: how to access the survey data results and how to properly clean the data, noting common errors to look for and needed changes to make.

STEP 8: DATA COLLECTION

The actual data-collection step depends on the size of the study area and, subsequently, the size of the workforce required. It is recommended that collectors work in pairs on each alley. Depending on collectors' schedules, works shifts can be formed around a geographic area, with more city blocks and alleys included if the shift is longer. A check-out and check-in process can be developed for collectors to pick up and drop off the required materials needed for each shift. Supervisors must make sure territory assignments are formed and hard-copy maps are printed for each team and shift. Data collectors were instructed to inspect every city block searching for alleys, whether the county basemap showed an alley or not.

Security in field

Safety of data collectors visiting and surveying alleys is paramount. It is essential to have a multilayer communications plan in place for all parties with an interest in the study area and the survey. It is also essential to have a comprehensive security protocol to avoid unsafe situations in field.

Data collectors should carry official documents from the sponsoring agency explaining the project and granting data-collection authorization. The documents should include agency official contact information should questions arise in field. Police and other relevant agencies should be informed and recruited to help communicate with all building managers in the survey area.

Relevant agencies can also publish and disseminate information on the survey and its progress to communicate with the public and relevant stakeholders. This communication can indicate where surveyors will be working and when. In Seattle, for example, the Seattle Police Department notified all building managers in the survey area in real time through the Seattle Shield program, a pre-existing information exchange for building operators and the police. SDOT also set up a new webpage at http://www.seattle.gov/transportation/thefinal50feet.htm to communicate with the public and relevant stakeholders.

It is recommended that data collectors follow a security protocol before entering the alley and once they are working inside the alley. In Seattle, data collectors were instructed to not enter in the alley if any staff felt uncomfortable. The presence of obstructions, such as garbage trucks, that made the alley access difficult was sufficient reason to avoid entering the alley. Once inside the alley, data collection teams were directed to exit the alley if any staff felt uncomfortable at any point while collecting features. In some cases, data collectors were able to go around the block to the second alley end point to finish the data collection. The survey logic considered possible interruptions, such as those due to security issues, so that valuable alley information was not lost and data collectors could at a minimum collect data from either end of an alley.

STEP 9: DATA CLEANING

After data collection, data must be cleaned. Both the data collectors and the supervisors play a role in this effort, which is detailed further in Figure A-2, Stage 3. The data collector must conduct a check of the surveyed alley locations after having completed in-field data collection. This step makes the final cleaning of the complete dataset easier and more efficient. The supervisor(s) can conduct their data-cleaning steps during the collection process, but must perform a comprehensive clean *after* all the data has been collected.

STEP 10: PUT TOGETHER AND SUMMARIZE THE DATA

Varying city needs may require different final formats. The final format can be a database made of spreadsheets with relationship between them. In the Seattle project, alleys were considered a point feature layer of alley reference end points, which could be displayed and mapped in GIS software. Most information about the alley was stored in a corresponding attribute table. Information about passenger parking, driveways, buildings' main entrances, and narrowest points along the alley were stored in table attachments that had a relationship one-to-many with the alley reference end points layer. Pictures of alley features were also collected and stored as JPEG files with a naming convention that allowed relating them to the corresponding alleys.

SDOT-UW FINAL 50' PROJECT TO2: TASK 2 AND TASK 3 - METADATA FORM

1. OBJECT INFORMATION

Layer file	Inventory of alleys in Center City area
Metadata Form Date:	03/07/2018

2. DATA SET INFORMATION

Title	Inventory of alleys in Center City area
Abstract:	Location, features and pictures of alleys and its driveways; parking facilities; building main entrances; and narrower points and sections.
Extent:	South Lake Union, Uptown, Belltown, Downtown, Capitol Hill, First Hill, Pike/Pine, 12th Ave, International District (West of I-5).
Data collection dates:	January 2018
Purpose:	Location and features of alleys in Center City area
Supplemental information:	NA: Information that is not applicable to that case. Unknown: Information that is missing or that was not visible or measurable because: the data collection team couldn't access the alley due to (1) construction, (2) temporal obstruction, or (3) safety concerns.
Keyword(s):	Seattle, alley

3. ALLEY INVENTORY TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Unique identifier of each survey
TNET_ID	None	King County - Metro Transportation Network (TNET) ID. **NA**: When the alley was not in the King County database.
TY_ED_RF	1 = Access Point 3 = Intersection with another alley 4 = Dead end to a physical barrier 5 = Dead end to driveway with access to street 6 = Dead end to open private property	Type of the alley's end point of reference. See Section 10. Definitions for a further description of the categories of this variable.
X_ED_RF	In linear feet calculated with ArcGIS	GIS X coordinate of the reference end point. Projected Coordinate System: NAD_1983_HARN_StatePlane_Washington_North_FIPS_4601_Feet
Y_ED_RF	In linear feet calculated with ArcGIS	GIS Y coordinate of the reference end point. Projected Coordinate System: NAD_1983_HARN_StatePlane_Washington_North_FIPS_4601_Feet
LONG_ ED_RF	In decimal degrees calculated with ArcGIS	GIS Longitude of the reference end point. World Geodetic System: System: GCS_WGS_1984
LAT_ ED_RF	In decimal degrees calculated with ArcGIS	GIS latitude of the reference end point. World Geodetic System: System: GCS_WGS_1984
STREET_RF	None	**If TY_ED_RF = "Intersection with another alley" or "Access Point",** name of the street closest to the reference end point. Otherwise, **NA.**
ST_WYRF	1 = One-way street 2 = Two-way street	**If TY_ED_RF = "Access Point",** traffic direction of the street closest to the reference end point. Otherwise, "**NA.**"
AP_SLPE_RF	In decimal degrees	**If TY_ED_RF = "Access Point",** cross slope of the apron of the reference end point. Otherwise, "**NA.**"
AP_WTH_RF	In feet	**If TY_ED_RF = "Access Point",** Apron width of the reference end point. Otherwise, "**NA**."
AP_LEN_RF	In feet	**If TY_ED_RF = "Access Point",** Length from the curb to the reference end point. Otherwise, "**NA.**"
ONE_WY_ALY	Yes or no	Indicates if the alley has a one-way traffic direction. The indication may be vertical signs or pavement markings.

3. ALLEY INVENTORY TABLE Continued

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
ALLEY_DIR	1 = North 2 = South 3 = East 4 = West 5 = Northeast 6 = Northwest 7 = Southeast 8 = Southwest	If ONE_WY_ALY = “yes”, Traffic direction of the one-way alley. Otherwise, “NA.”
BLOCKED	1 = Construction 2 = Gate 3 = Blocked by a truck 4 = Other	Type of obstruction that impeded measuring inside the alley.
ALY_WTH_RF	In feet	Width of the reference end point measure as the narrowest width within 30ft of the alley.
SIGN_RES	Yes or no	Indicates the existence of a sign restricting the alley usage.
ALY_LENGTH	In feet	Total length of the alleyway.
PAVE_TYP	1 = Asphalt 2 = Concrete 3 = Cobblestones 4 = Other 5 = Gravel	Alley pavement surface type in the majority of the surface.
PAVE_COND	1 =Good 2 = Poor	Qualitative pavement condition assessment based on a subjective evaluation. Pavement in poor conditions are potentially poor for hand carts due to severity of irregular pavement.
GARB_CANS	None	Total number of garbage cans or bins found in the alley.
OIL_CANS	None	Total number of garbage cans or bins for oil found in the alley.
DEBRIS	Yes or no	Indicates the presence or not of debris in the alley.
FURNITURE	Yes or no	Indicates the presence or not of street furniture in the alley.
ALY_WTH_ED	In feet	Width of the opposite alley’s end point measure as the narrowest width within 30ft of the alley.
TY_ED	1 = Access Point 3 = Intersection with another alley 4 = Dead end to building outline 5 = Dead end to driveway with access to street 6 = Dead end to open private property	Type of the opposite alley’s end point. See Section 10. Definitions for a further description of the categories of this variable.

3. ALLEY INVENTORY TABLE Continued

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
X_ED	In linear feet calculated with ArcGIS	GIS X coordinate of the opposite end point. Projected Coordinate System: NAD_1983_HARN_StatePlane_ Washington_North_FIPS_4601_Feet
Y_ED	In linear feet calculated with ArcGIS	GIS Y coordinate of the opposite end point. Projected Coordinate System: NAD_1983_HARN_StatePlane_ Washington_North_FIPS_4601_Feet
LONG_ ED	In decimal degrees calculated with ArcGIS	GIS Longitude of the opposite end point. World Geodetic System: System: GCS_WGS_1984
LAT_ ED	In decimal degrees calculated with ArcGIS	GIS latitude of the opposite end point. World Geodetic System: System: GCS_WGS_1984
STREET_ED	None	**If TY_ED_RF = "Access Point",** name of the street closest to the reference end point. Otherwise, **NA.**
ST_WYED	1 = One-way street 2 = Two-way street	**If TY_ED_RF = "Access Point",** traffic direction of the street closest to the reference end point. Otherwise, "**NA.**"
AP_LEN_ED	In feet	**If TY_ED_RF = "Access Point",** name of the street closest to the opposite end point. Otherwise, "**NA.**"
AP_SLPE_ED	In decimal degrees	**If TY_ED_RF = "Access Point",** cross slope of the apron of the reference end point. Otherwise, "**NA**."
AP_WTH_ED	In feet	**If TY_ED_RF = "Access Point",** Apron width of the reference end point. Otherwise, "**NA.**"

4. NARROWER POINTS TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Foreign key corresponding to GlobalID in Table Alley Inventory.
NRW_X1	In feet	Distance from the reference end point to the location of (1) the narrower point, or (2) the start of the narrower section. Narrower points and sections are restrictions to the alley effective width (min. 1ft.) or effective height (below 16 ft.)
NRW_TYP	1 = Bollards 2 = Building outline 3 = Camera 4 = Electric Panels 5 = Fire escapes 6 = Mirrors 7 = Parking / Commercial ventilation intakes or exhaust 8 = Projecting lights 9 = Signs 10 = Standpipes 11= Transformer equipment 12 = Trash chutes 13 = Other	Type of physical obstruction(s) that results in narrower points or sections.
NRW_DIM	1 = Point restricting width 2 = Point restricting height and width 3 = Section restricting width 4 = Section restricting height and width	Dimension(s) restricted by the narrower point or section.
NRW_WTH1	In feet	Effective width of the alley at the narrower point or the start of a narrower section.
NRW_HGT	In feet	**If NRW_DIM = "Point restricting height and width" or NRW_DIM = "Section restricting height and width",** Effective height of the alley at the narrower point or section. Otherwise, "**NA.**"
NRW_WTH2	In feet	**If NRW_DIM = "Section restricting width" or NRW_DIM = "Section restricting height and width",** Effective width of the alley at the end of the narrower section. Otherwise, "**NA.**"
NRW_X2	In feet	**If NRW_DIM = "Section restricting width" or NRW_DIM = "Section restricting height and width",** Distance from the reference end point to end of the narrower section. Otherwise, "**NA.**"

5. BUILDING MAIN ENTRANCES TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Foreign key corresponding to GlobalID in Table Alley Inventory.
MPRV_X	In feet	Distance from the reference end point to where the main private entrance is located.
BLDG_ADDR	None	Building address.

6. PARKING FACILITY ACCESS TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Foreign key corresponding to GlobalID in Table Alley Inventory.
PKG_X	In feet	Distance from the reference end point to where the parking access is located. Only includes parking facilities that can be accessed via the alley. The open-air surface parking lots were recorded based on the midpoint of the lot frontage on the alley.

7. DRIVEWAYS TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Foreign key corresponding to GlobalID in Table Alley Inventory.
DRIVE_X	In feet	Distance from the reference end point to where the driveway is located
DRIVE_PKG	Yes or no	Indicates if the driveway provide access to a parking lot
DRIVE_CON	Yes or No	Indicates if the driveway connects with a street.
DRIVE_ST	None	**If DRIVE_CON = "Yes",** name of the street connected to the driveway

8. NON-EXISTING KING COUNTY'S ALLEYS TABLE

ATTRIBUTE	CODE DOMAIN	DESCRIPTION
GLOBALID	None	Foreign key corresponding to GlobalID for picture database.
TNET_ID	None	King County - Metro Transportation Network (TNET) ID

9. PICTURE DATABASE

The picture database related to the infrastructure database consists of a folder with all pictures in JPG format collected in the field for each alley. The pictures in the database follow a naming system that allows identifying each of the pictures corresponding to each alley. The JPG files are named as follows:

"GLOBALID of alley_Variable name of the picture.jpg."

GLOBALID variable is described in Section 3 above and consist of an integer that serves as a unique identifier of each infrastructure in the database. *Variable name of the picture* refers to each of the possible variable names of type picture that relate to a specific feature of the infrastructure as described below.

ATTRIBUTE	DESCRIPTION
GLOBALID	Unique identifier of each survey
PIC_ALY_ST	Picture of the reference end point
PIC_DR_SGN	**If ONE_WY_ALY = "Yes",** Picture of the alley "One way" sign
PIC_RES_1	**If SIGN_RES = "Yes",** Picture of the alley usage sign
PIC_RES_2	**If SIGN_RES = "Yes",** Picture of the alley usage sign
PIC_BKED OR PIC_INALY	In case of obstructed alley, picture of the area within the alley
PIC_NRWPT1	Picture of the narrower point or section
PIC_NRWPT2	Picture of the narrower point or section
PIC_MPRV	Picture of the main private entrance
PIC_PKG	Picture of the parking access
PIC_ALYDRIVE	Picture of the driveway
PIC_PAVE	Picture of the pavement surface
PIC_DEND OR PIC_ALY_ED	Picture of the opposite end point
PIC_NOALY1	Picture of location of alleys that no longer exist

10. DEFINITIONS

10. 1 General definitions

Alley end points. The point where an alley begins or ends. By definition, every alley has two end points.

10.2 Code Definitions

TY_ED and TY_ED_RF code dictionary

CODE	DESCRIPTION
Access Point	End point located at the block face of a city block. This is the most common prevalent example of an end point. Often there will be buildings on either side of the alley's access point but in some cases, there may be vacant lots or surface parking lots.
Intersection with another alley	End point where two alleys intersect inside a city block.
Dead end at a physical barrier	End point where an alley ends at a dead-end impassible for vehicles, such as a building outline and staircase.
Dead end at a driveway with access to the street	End point where an alley dead-ends at a driveway, which provides access to the street.
Dead end at open private property	End point where an alley dead-ends at open private or public property, such as a public square.

ALLEY SURVEY MATERIALS LIST

Laster Measure Tool We used Bosch model GLM 80 Must be able to measure angle of apron, in addition to taking horizontal and vertical measurements	
Measuring wheel We used a model that measured in feet and inches	
iPad for data collection survey	
Protective, waterproof case with neck strap for iPad Allows data collector to wear iPad around his or her neck, preventing him or her from having to carry it in hand. Also allows easy access to it in field, and protects it from weather elements.	

Portable battery charger and cord for charging iPad in-field	
Reflective safety vest	
Clipboard, pen	
Paper maps showing data collector's territory and alleys to be surveyed	

Alley Inventory and Truck Load/Unload Occupancy Study
Urban Freight Lab
Final 50’: Goods Delivery System Research Project
Task Order 4

Training Session - Winter 2018

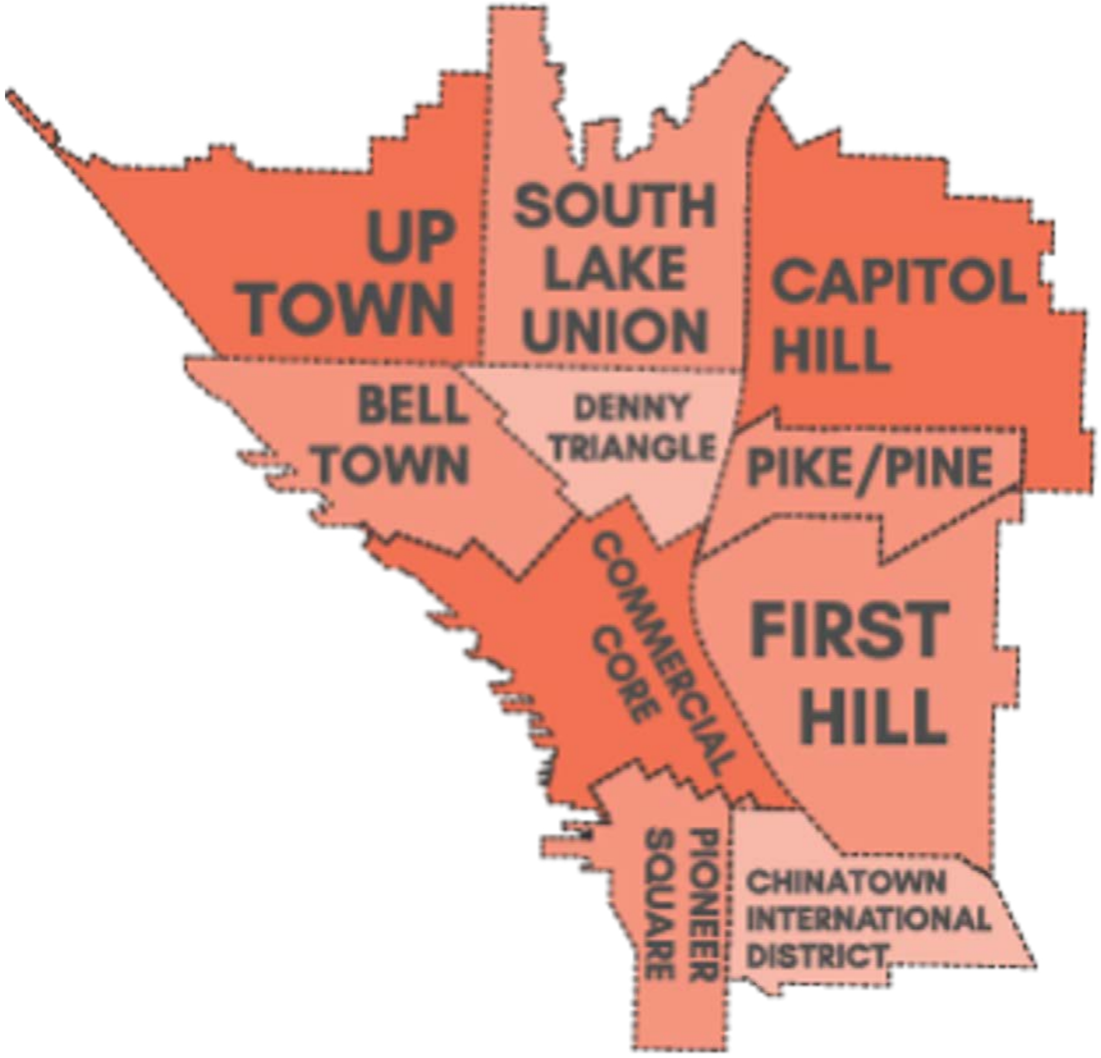

GARBAGE
i © ilophotography.com

Study Area

SDOT has engaged the Urban Freight Lab to identify the geospatial locations and features of alleyway infrastructure in One Center City.

The urban centers include:

- Downtown
- Uptown
- South Lake Union
- Capitol Hill
- First Hill



Credit: http://onecentercity.org/

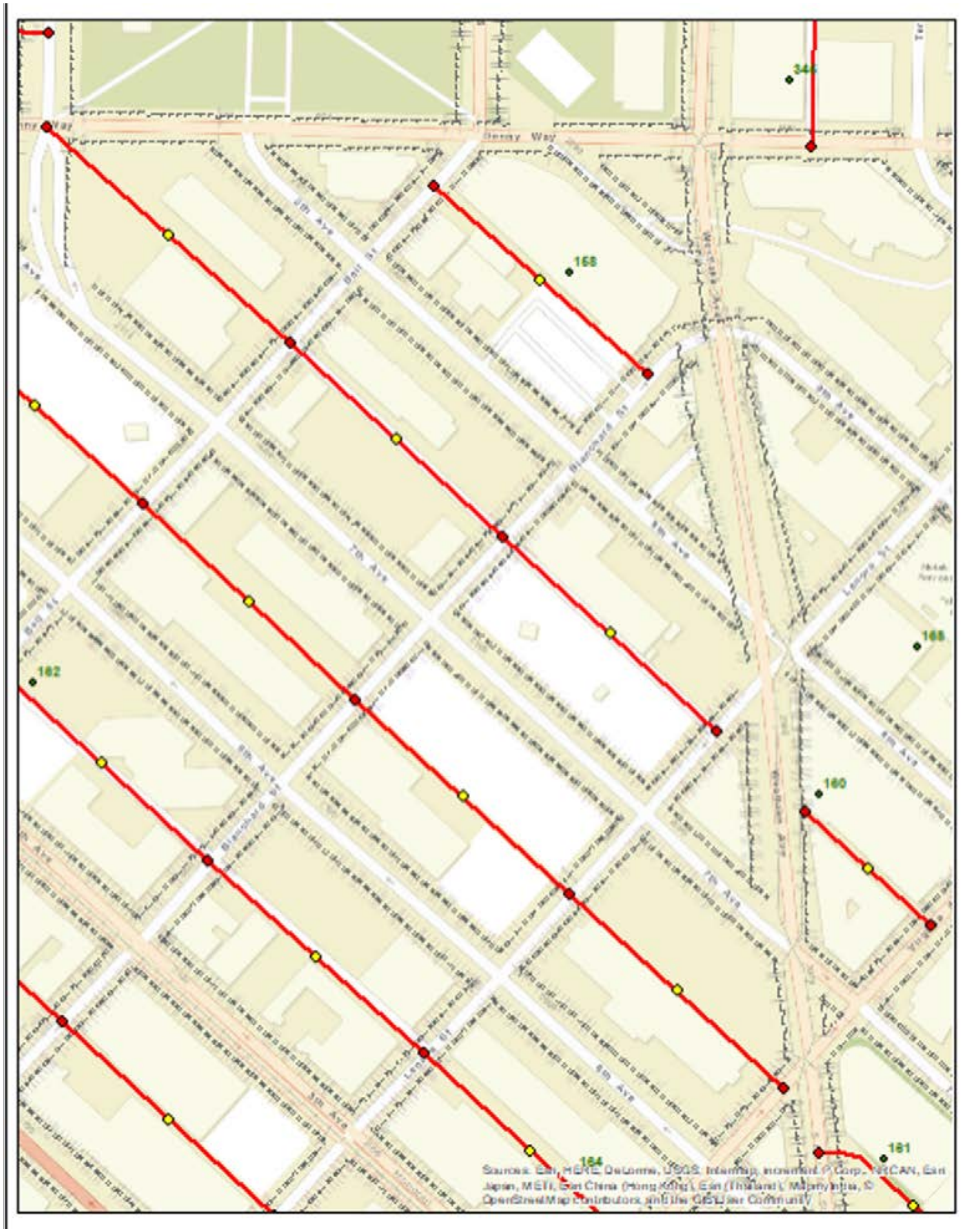
Four Data Collection Principles

The Urban Freight Lab adheres to four principles when designing data collection approaches. To be widely used, the method must be:

1. Replicable;
2. Available at a reasonable cost;
3. Groundtruthed;
4. And have quality control measures built into each step.

Data collection Plan

- We work in teams of two
- Your assigned shift can be Monday through Saturday, anytime between 8:00 am and 5:00 pm, depending on your availability.
- Data collection will involve walking around city blocks looking for alleyways.
- We set short term goals with subareas.



Data Collection Tools

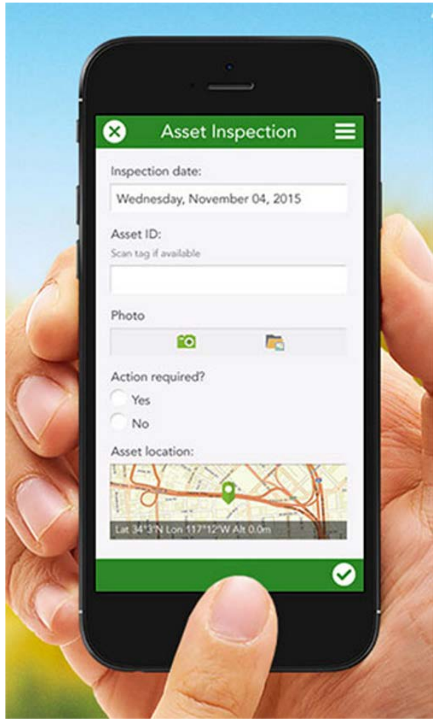
Laser device

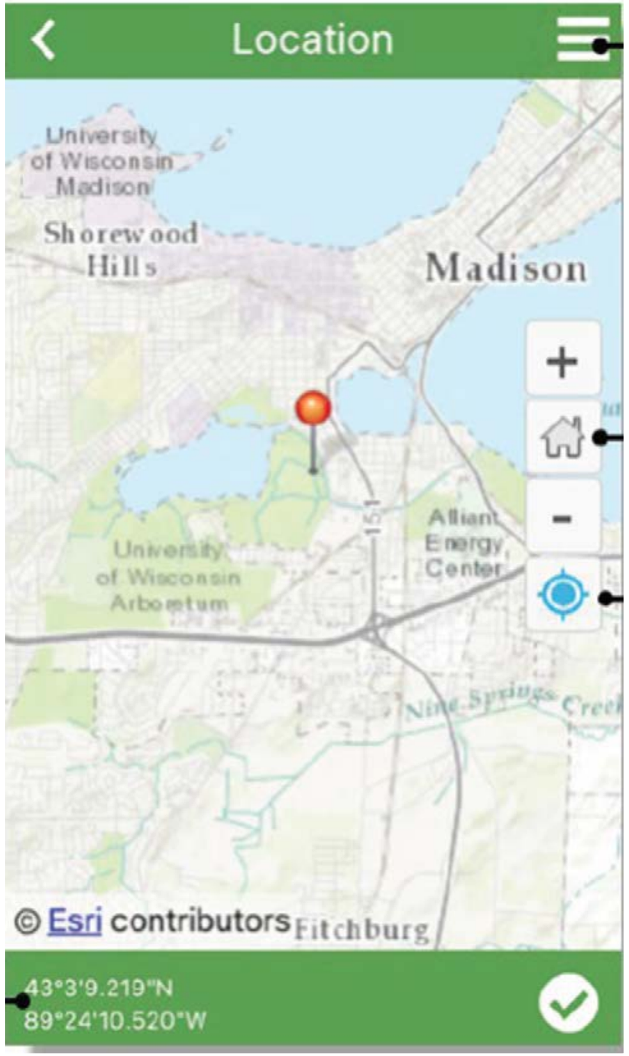
PC Tablet

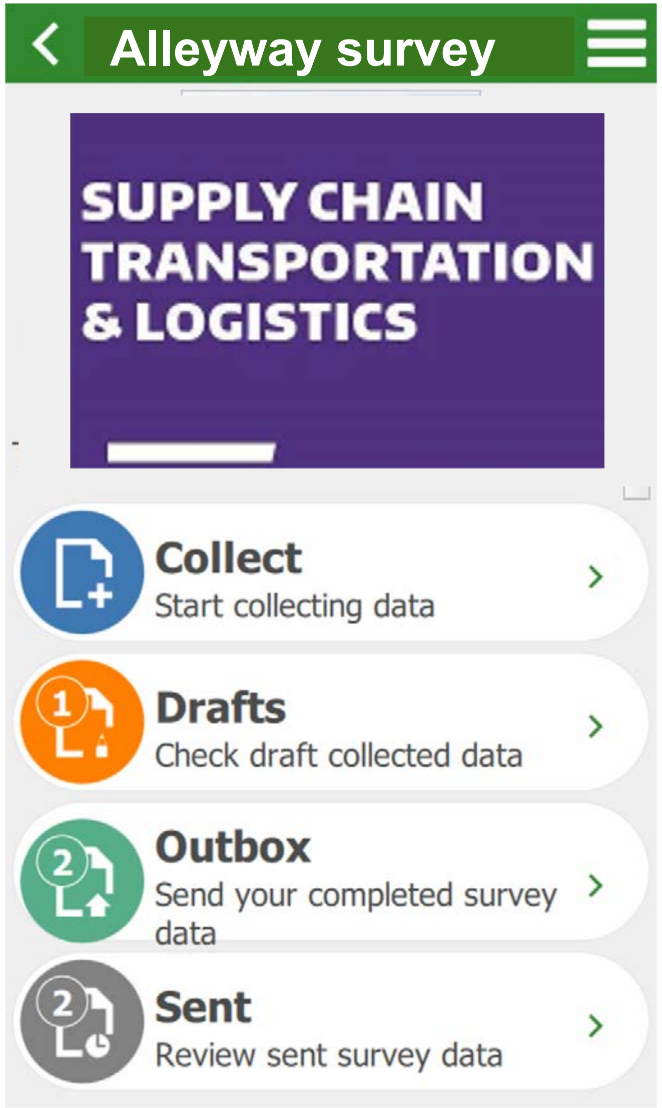
City blocks map

Measuring wheel

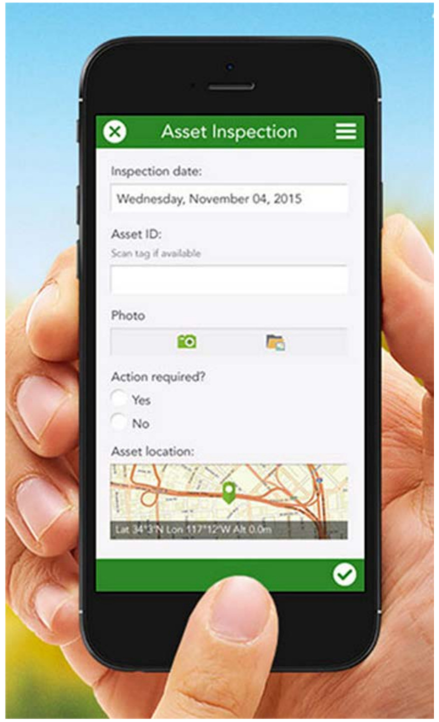
Data Collection App

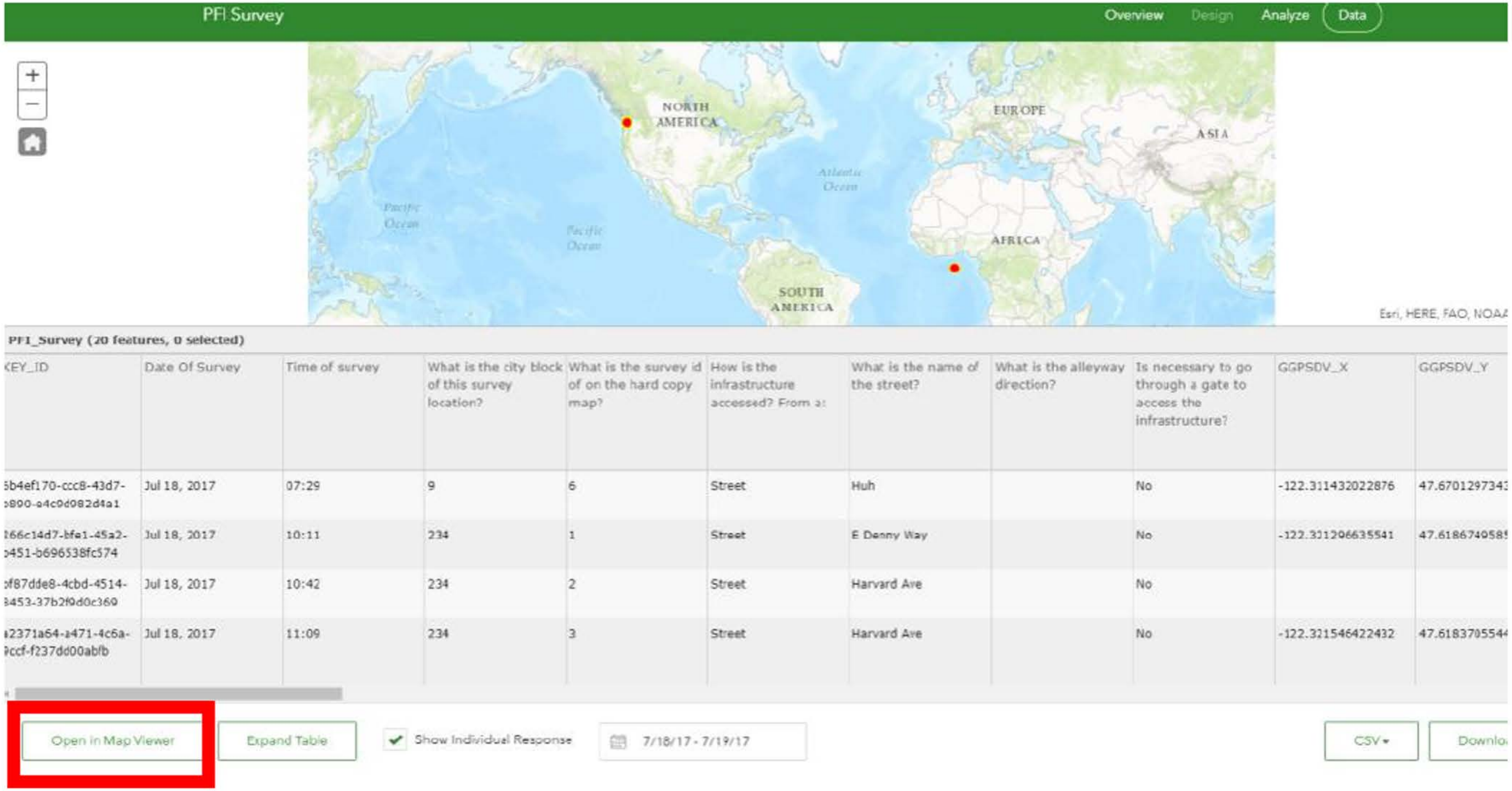






Data Collection Tools: Integrated System



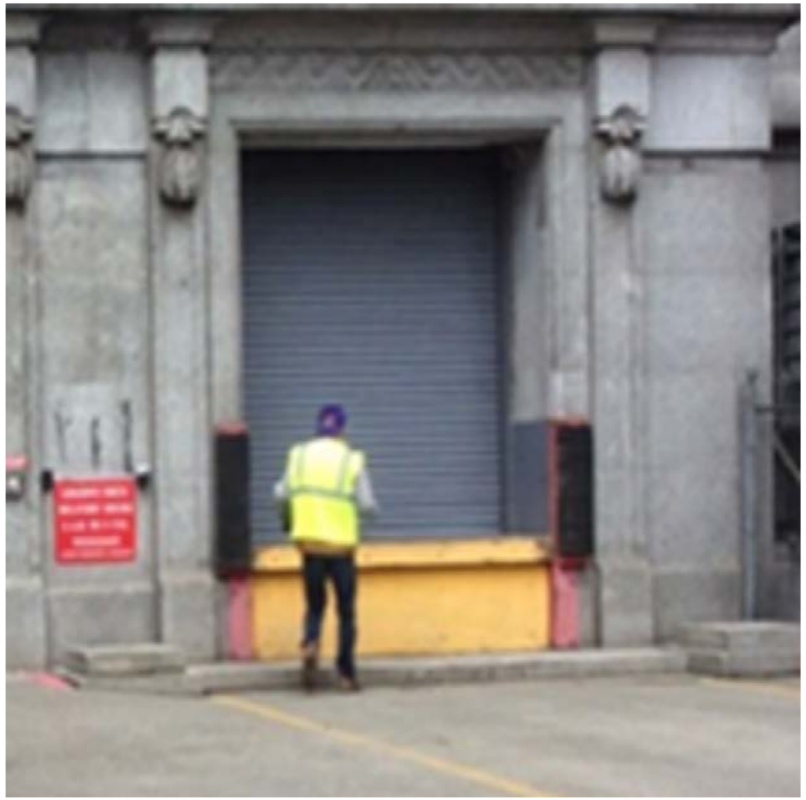


Security Protocol

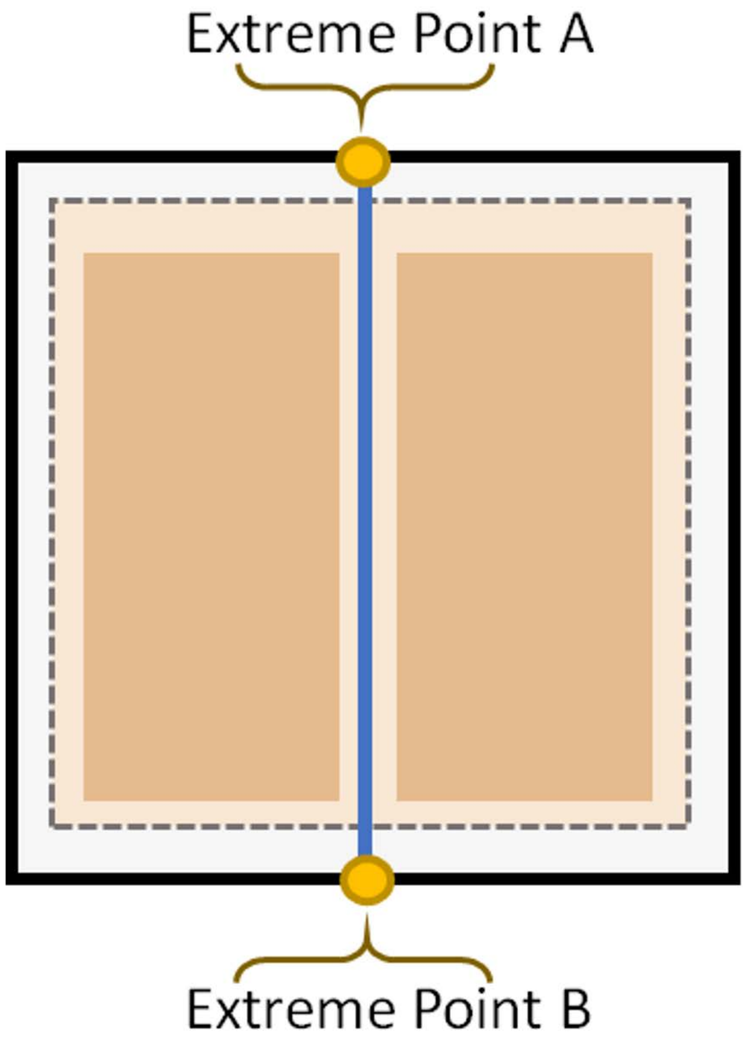
UW letter and security vest

Seattle Shield Blast

SDOT website – Final 50 Feet Program



Alleyways' Extreme Points



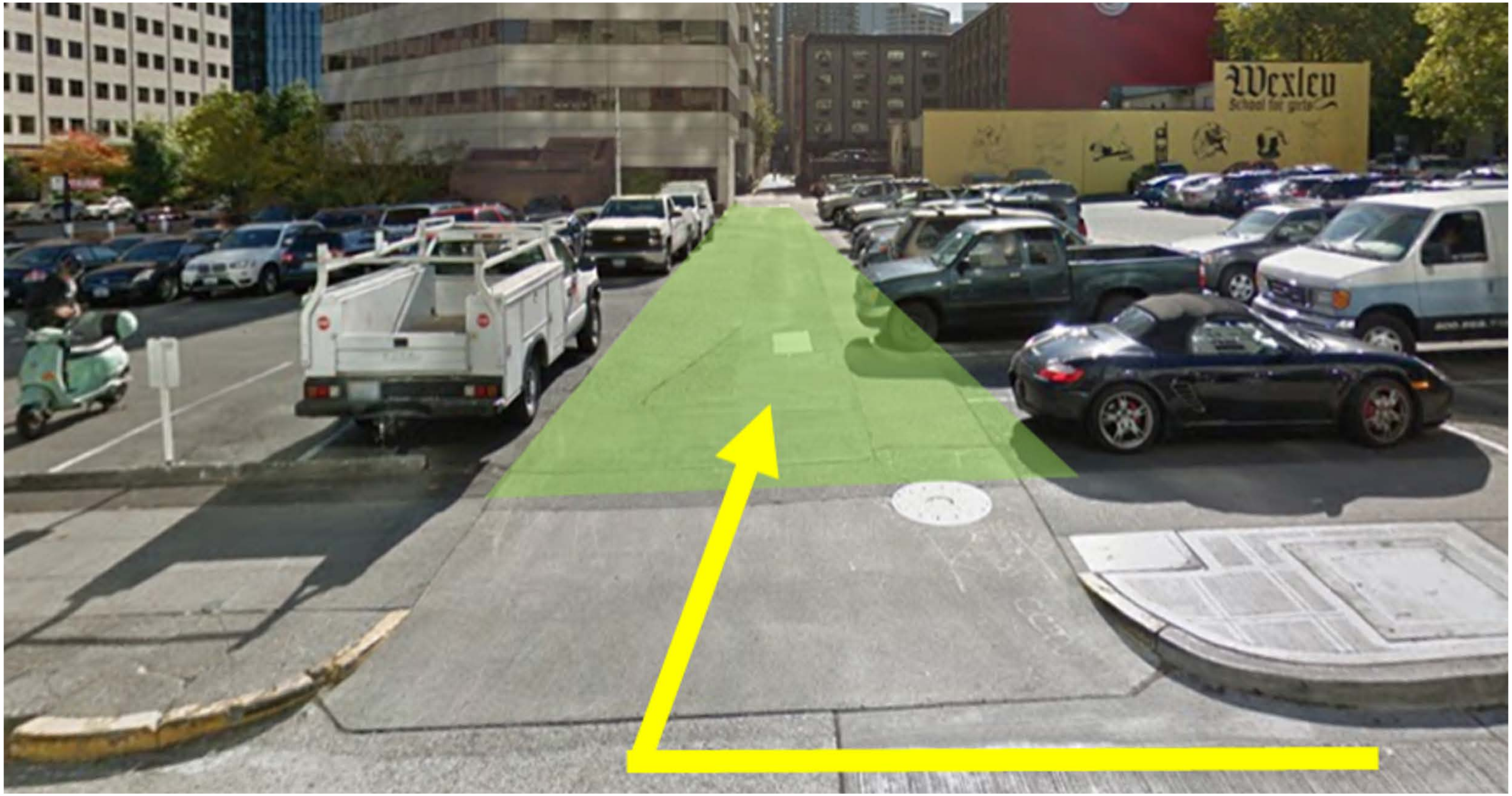
Categories

- Access Points
- Dead End
- Intersections

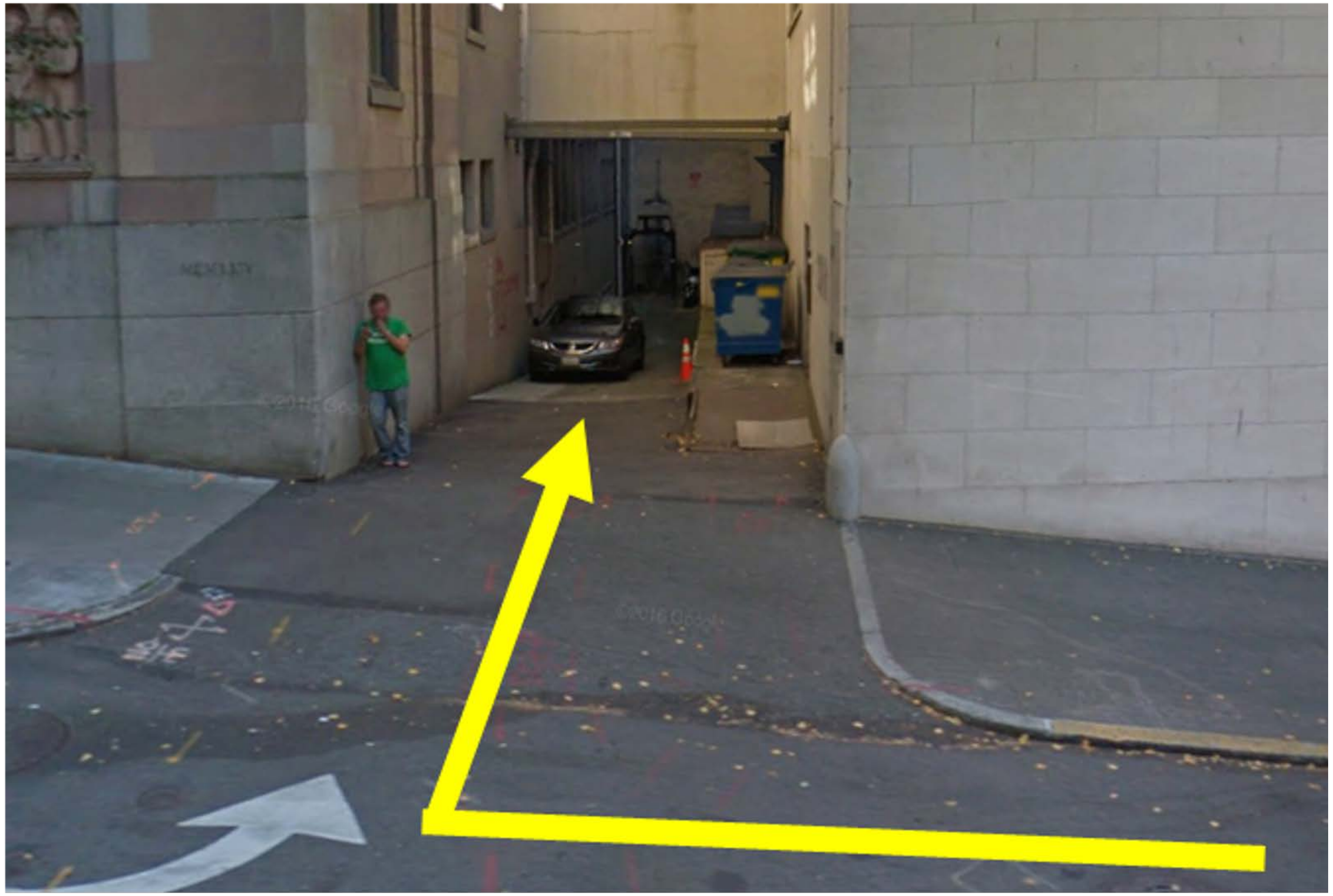
Alleyways' Extreme Points - Access Points (1/2)

Located in the public right away with access to street.

Alleyways' Extreme Points - Access Points (2/2)

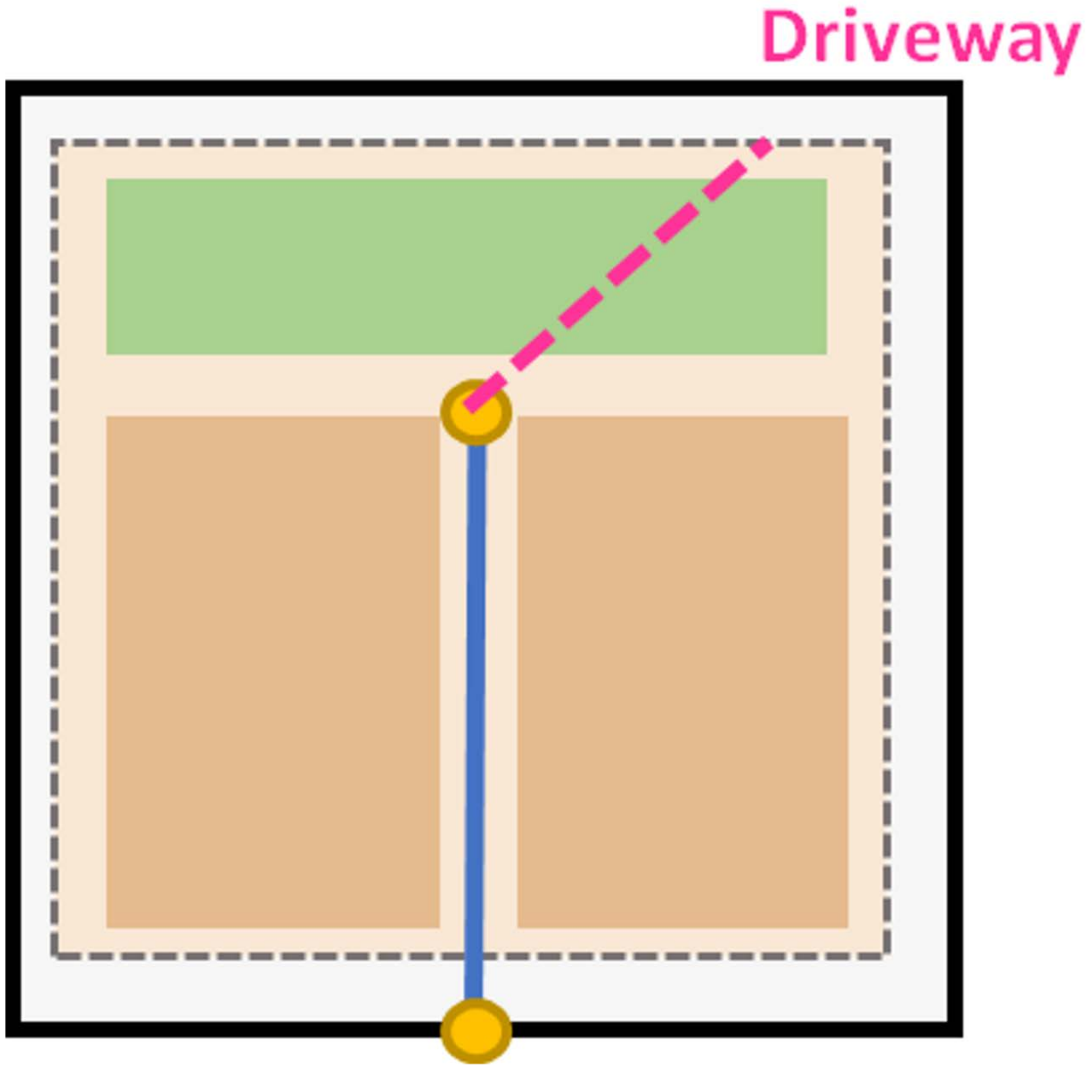


Alleyways' Extreme Points - Dead end (1/3)



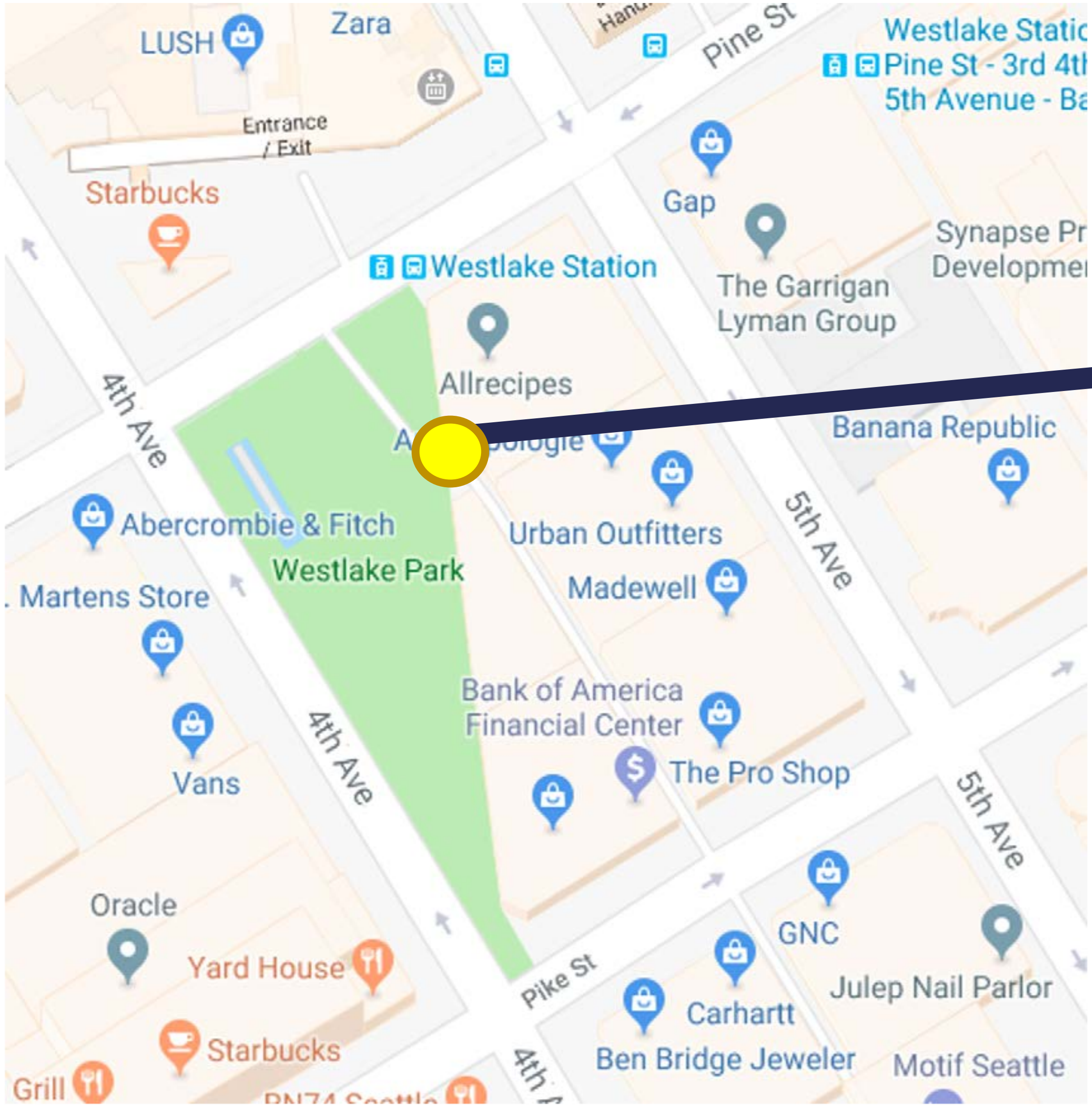
Dead end Type 1:
Ending at a to building outline.

Alleyways' Extreme Points - Dead end (2/3)



Dead end Type 2:
Ending at a driveway with access to street.

Alleyways' Extreme Points - Dead end (3/3)

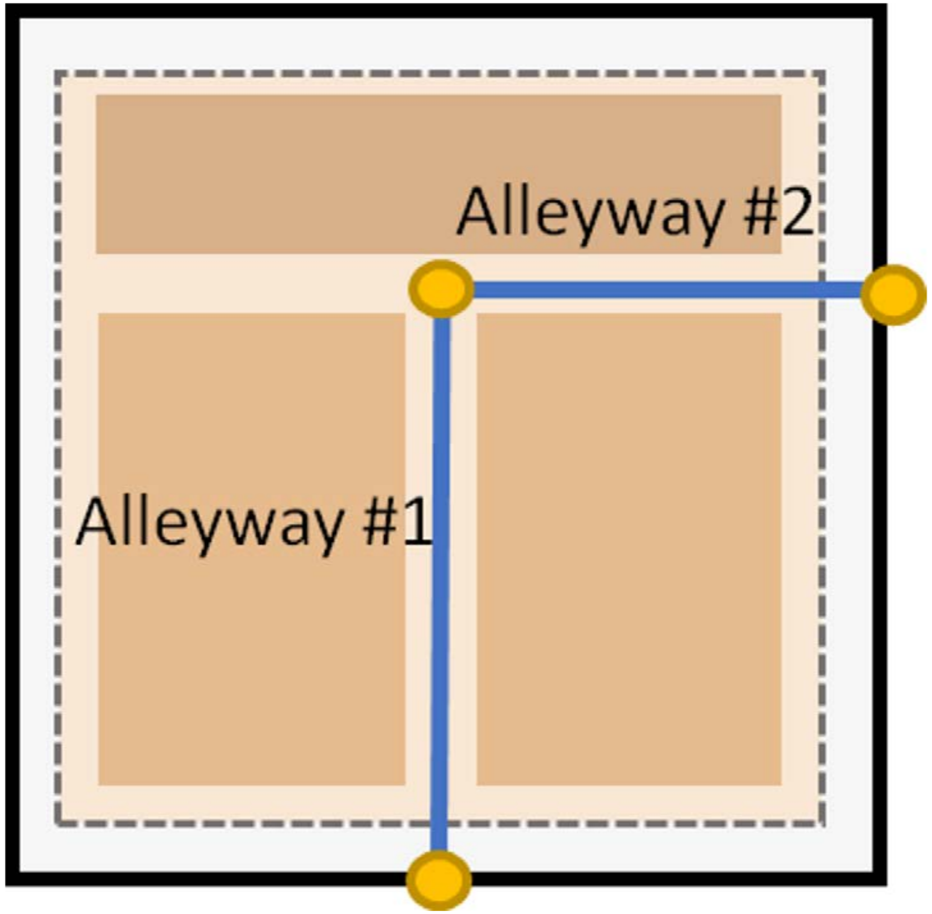


<u>Dead end Type 3:</u>
Ending at open property.

Alleyways’ Extreme Points - Intersection

Intersection within the city block between:

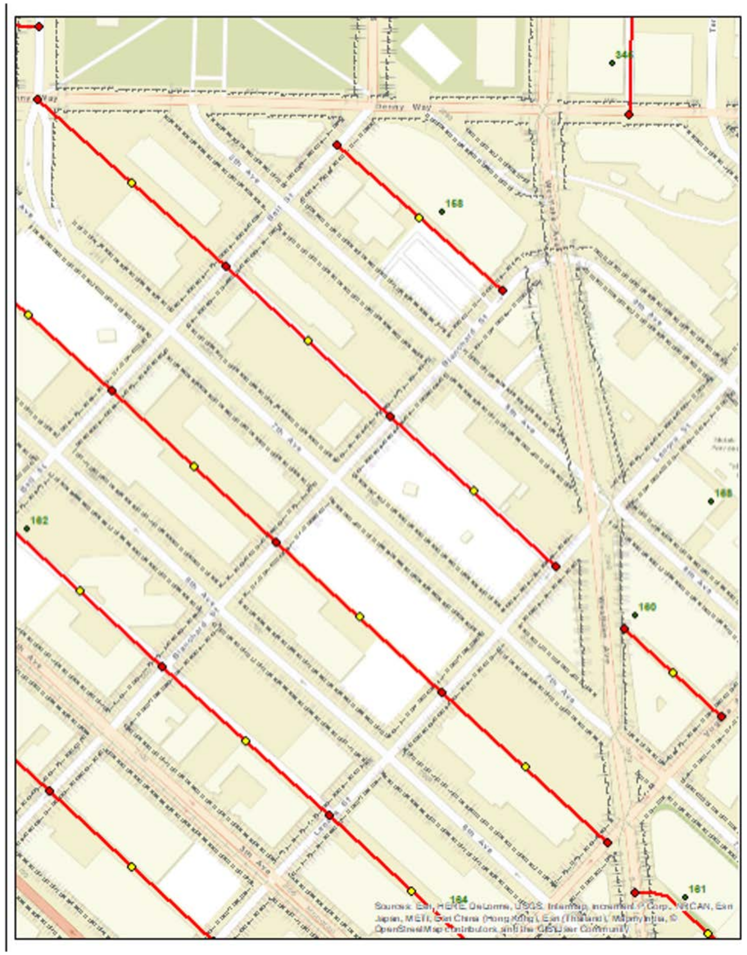
- Two alleyways
- An alleyway and a street



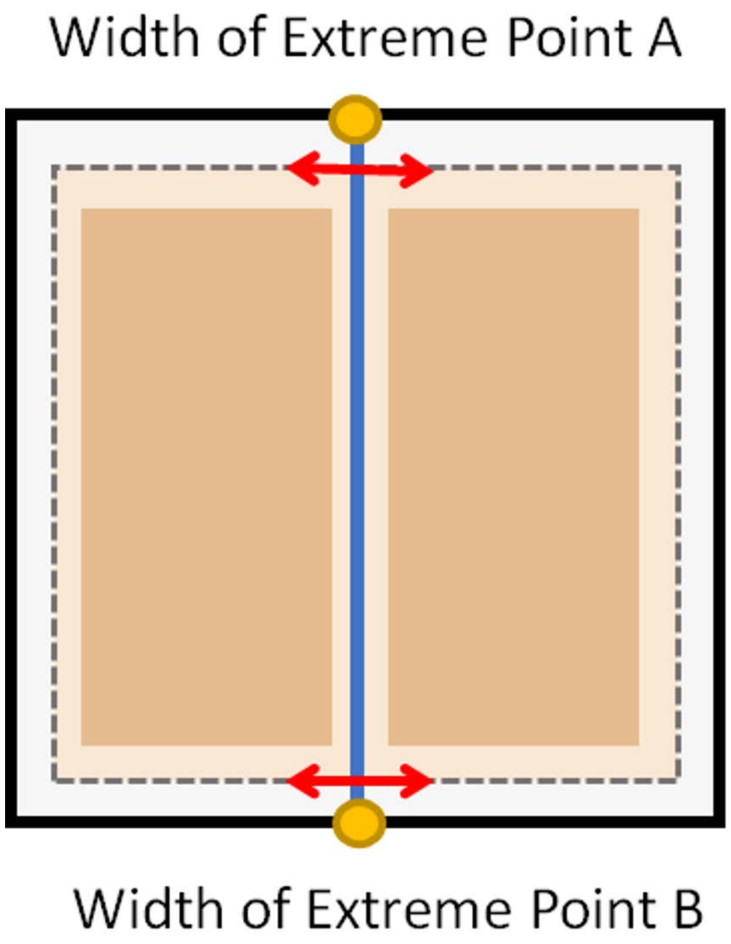
Revising King County alleyway database

<u>Question to be answer:</u>

Is the alleyway shown on the base map?



Selecting the survey start point



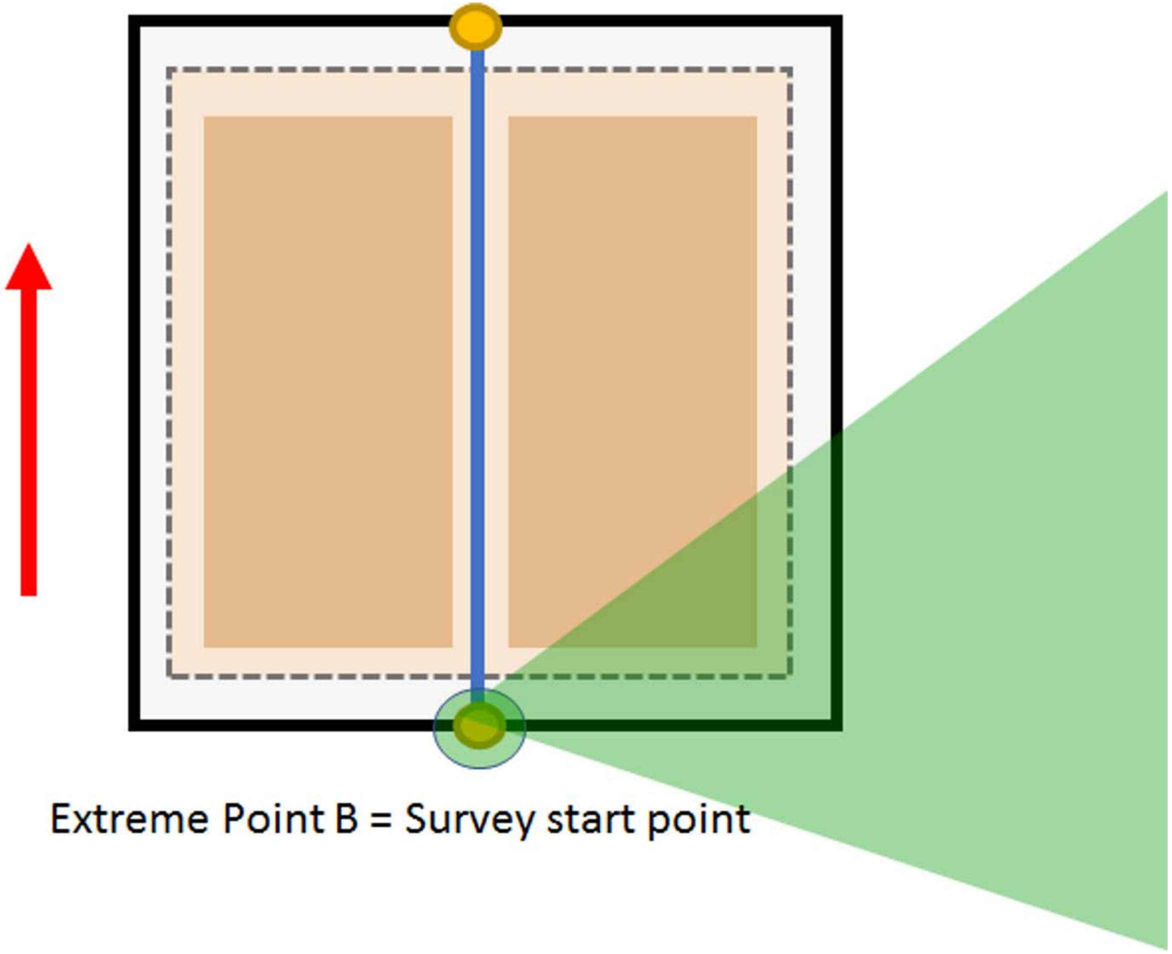
If the alleyway exists in field, then:

a. Compare the width of the alleway extremes UNLESS the extremes are (1) dead end ending at a building outline or (2) an intersection.

a. Start the survey at the narrower extreme. For example:
   - *If* **width_A > width_B,**

     Then **Point_B** = survey start point.

Features at the extreme point - Survey start point



We will collect :

A. **Geolocation**
B. Width within 30ft. Into the alley
C. Street name closest to extreme point
D. Apron features

Note: (depending on extreme point category)

Limitations to survey within the alleyway

Safety Parameter

Obstructed alleyway

Note:

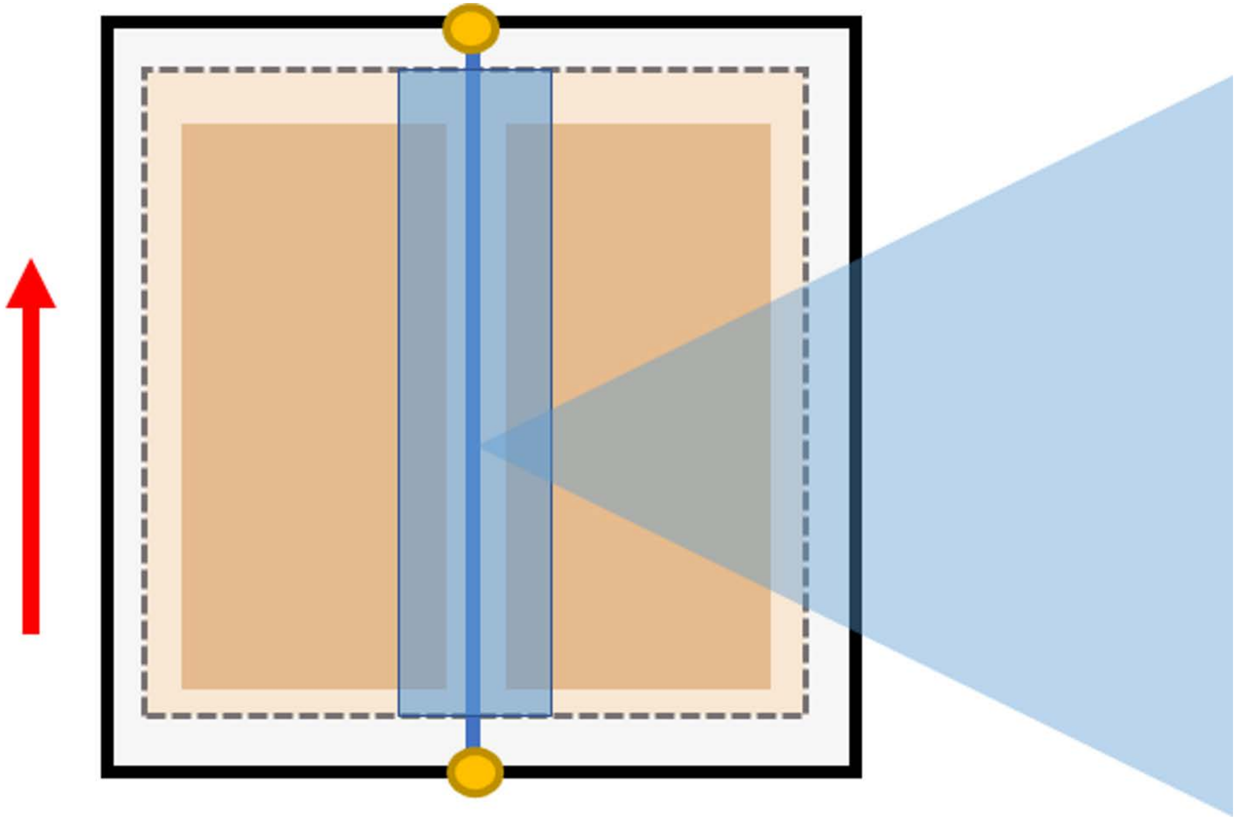
*Don't enter the alley if any of the **team members feel uncomfortable**!*

Security Protocol within the alleyway

Note:
*If any of the team members feel **uncomfortable at ANY point** while collecting the features within the alley,get out of the alley!*

If able, go to the second access point (i.e. the endpoint of the survey) to finish your data collection (unless the alley ends in a dead end).

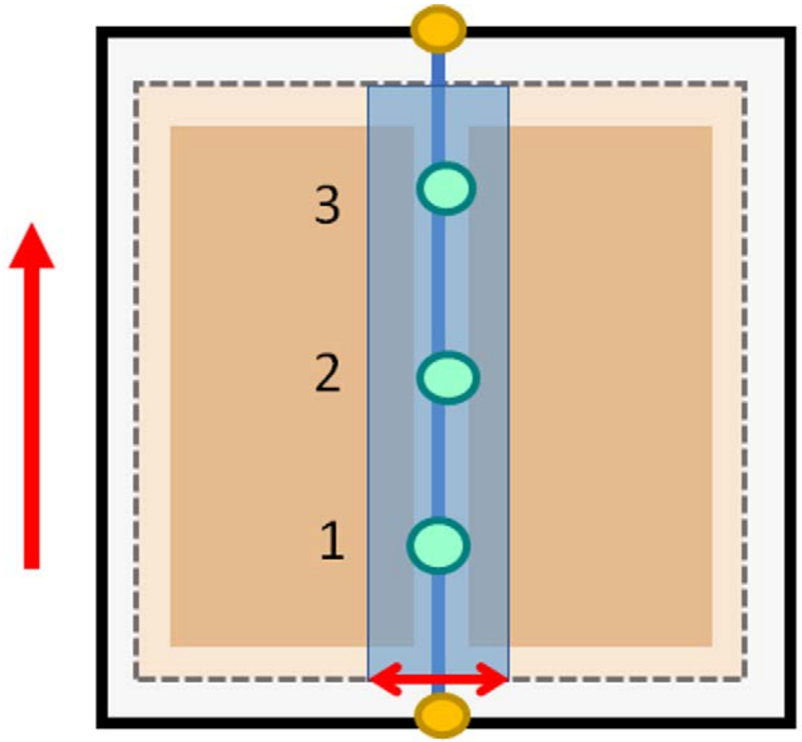
Features within alleyways



We will collect:

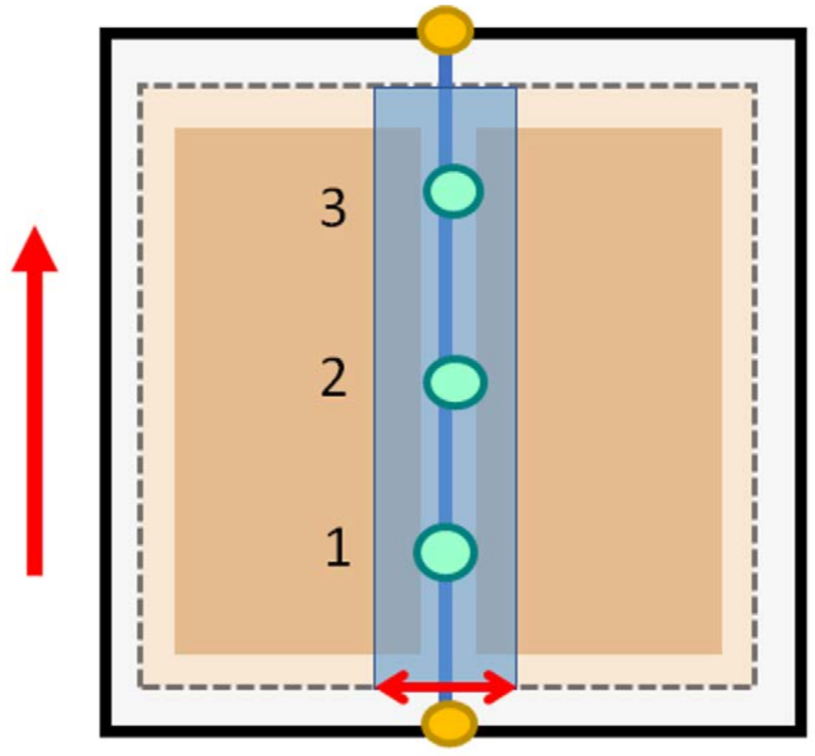
A. Narrower points and sections
B. Parking facilities
C. Main entrances to buildings
D. Driveways
E. Alleyway Length
F. Pavement conditions
G. Count of obstructions
H. Presence of temporal obstructions

A. Narrower points & sections



W = Width of Extreme Point B

A. Narrower points - width restriction

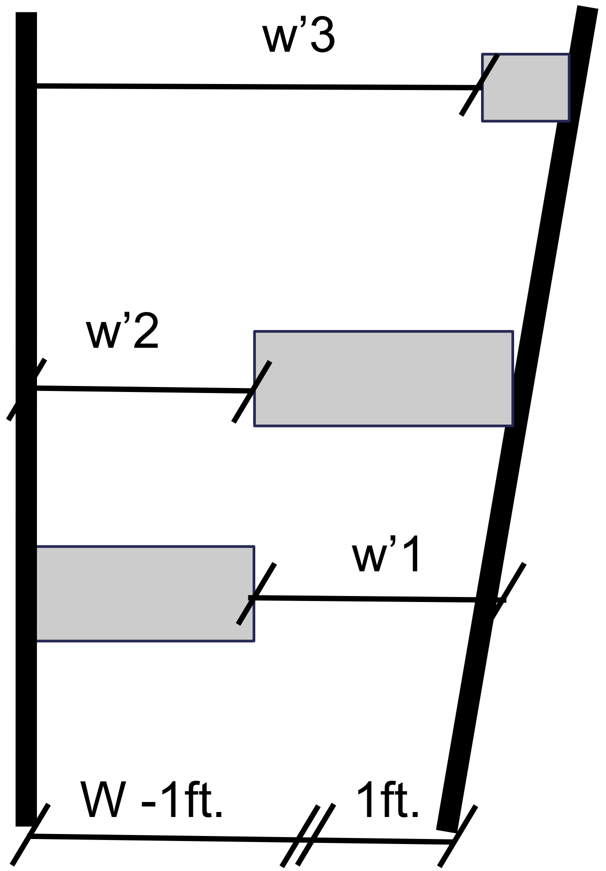


W = Width of Extreme Point B

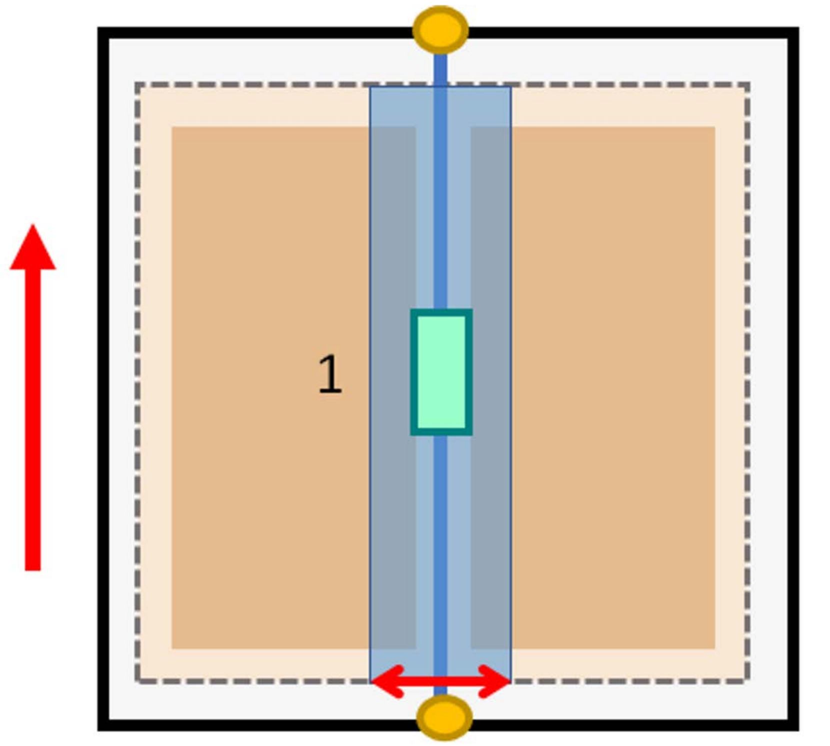
w'3 > W -1ft. ✗

w'2 < W-1ft. ✓

w'1 < W -1ft. ✓



A. Narrower sections - width restriction



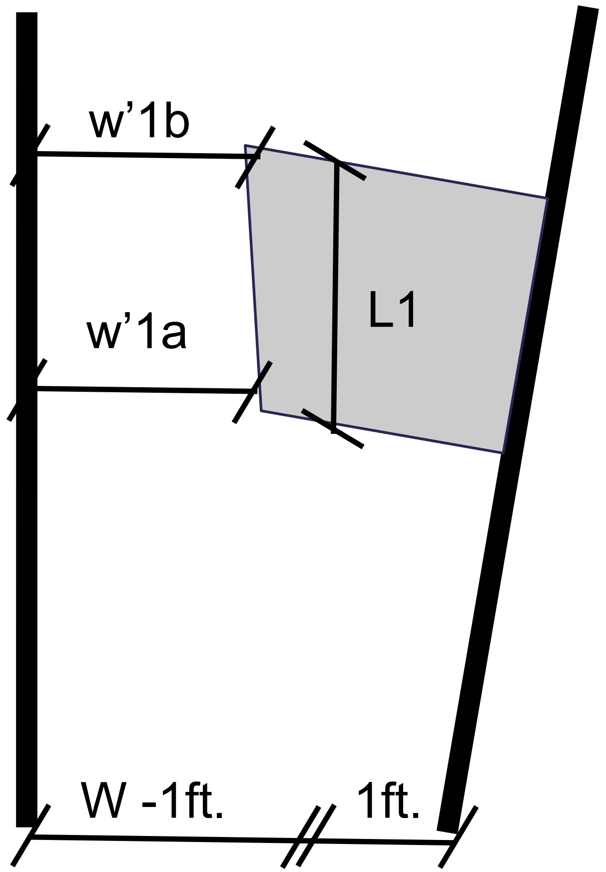
W = Width of Extreme Point B

w’1a < W-1ft.

w’1b < W-1ft.

L1 > 10 ft.

✓



A. Narrower points & sections - height restriction

Obstructions that are:

- Width restrictions
- Located within 16ft. from the ground

A. Narrower points & sections - Types (1/2)

Transformer Equip.

es

Electric Panels

Fire escape

Projecting Lights

A. Narrower points & sections - Types (2/2)

Signs

Chutes

Bollards

Parking/ Commercial
Vent intakes or exhaust

B. Parking facilities - Types (1/2)

Parking garages

Surface

parking lots

B. Parking facilities - Types (2/2): Freight facilities

Outside of building walls

EXTERIOR LOADING DOCK

EXTERIOR LOADING AREA

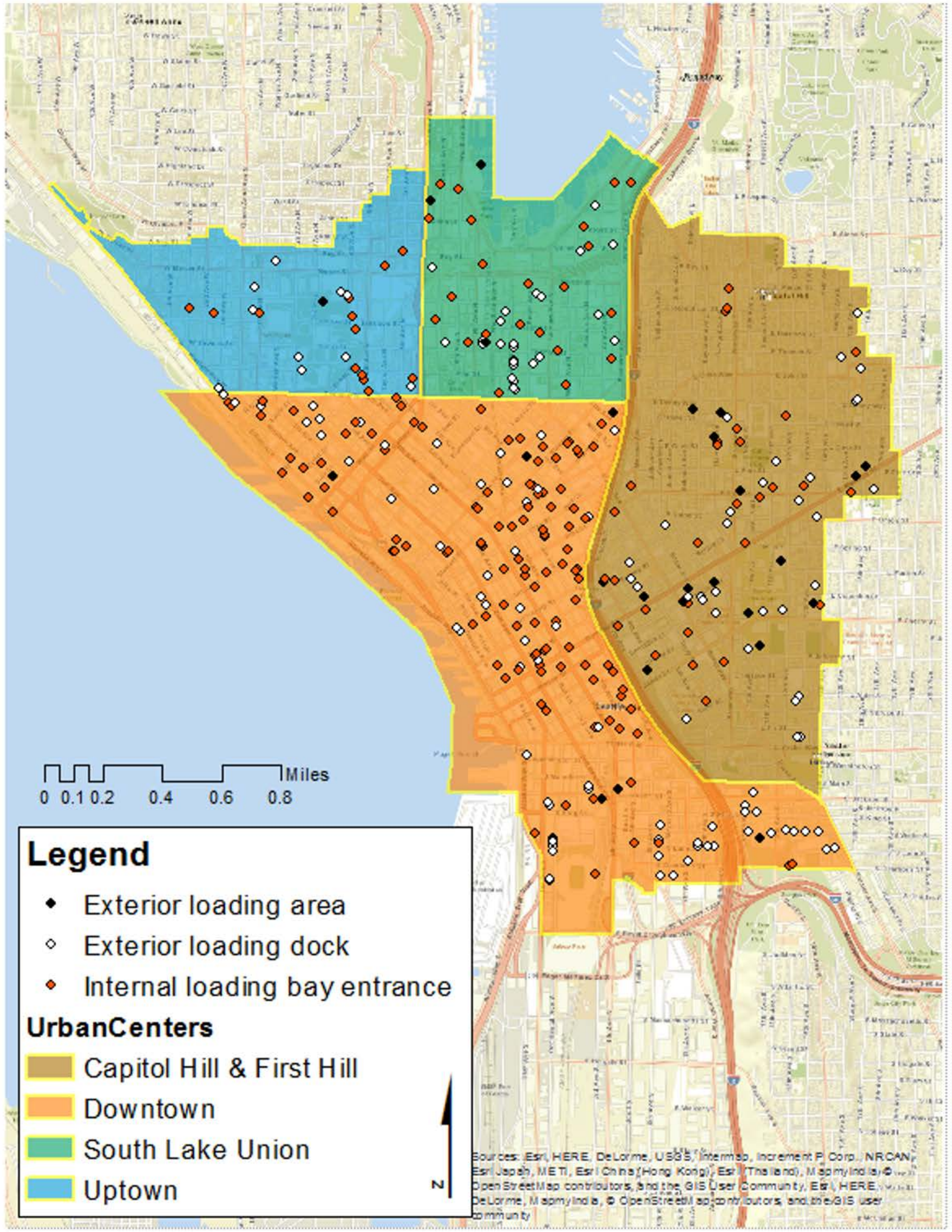
Interior of exterior wall

INTERNAL LOADING BAY

B. Parking facilities - Freight facilities

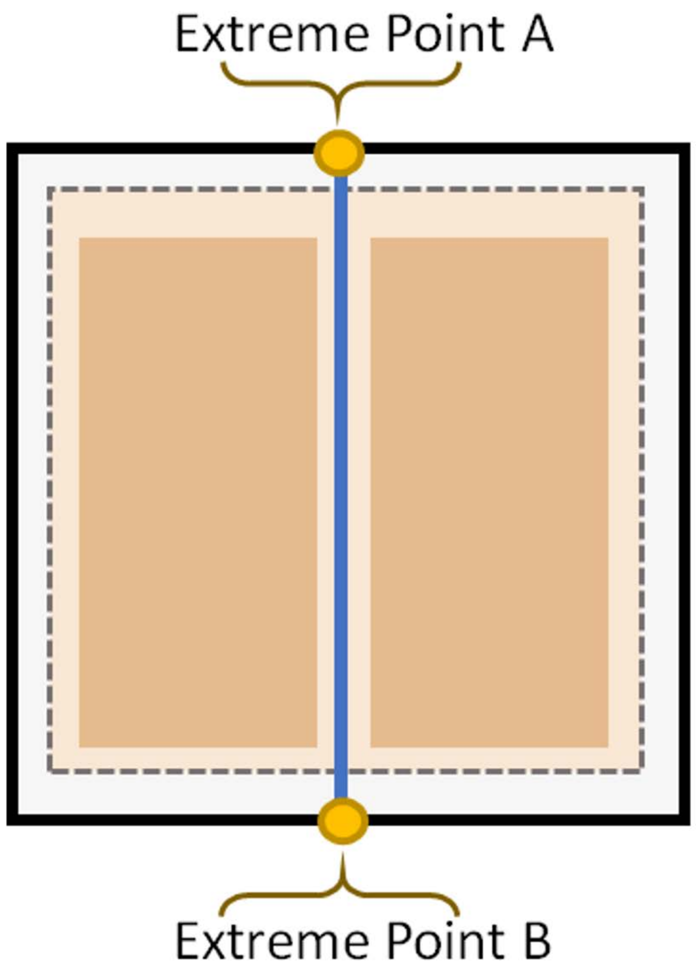
To link both databases, we will use readily available data:

- Location (basemap)
- Facility ID number
- Pictures



T-Net layer | Extreme Point | Before entering | **Within Alley** | Extreme Point

Data Collection Method: A 5 step survey



Step 1. Checking of King County database

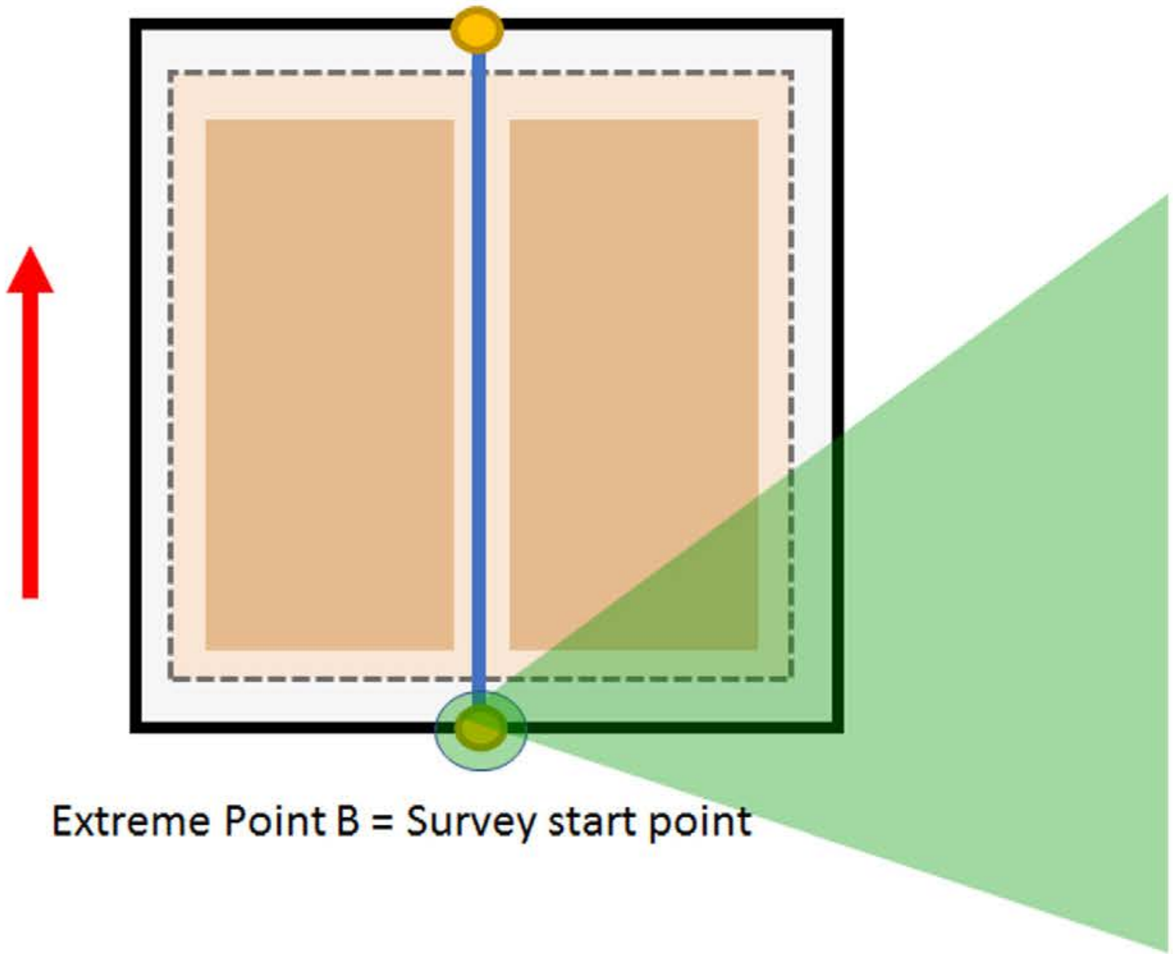
Step 2. Alleyway's "Extreme Point"

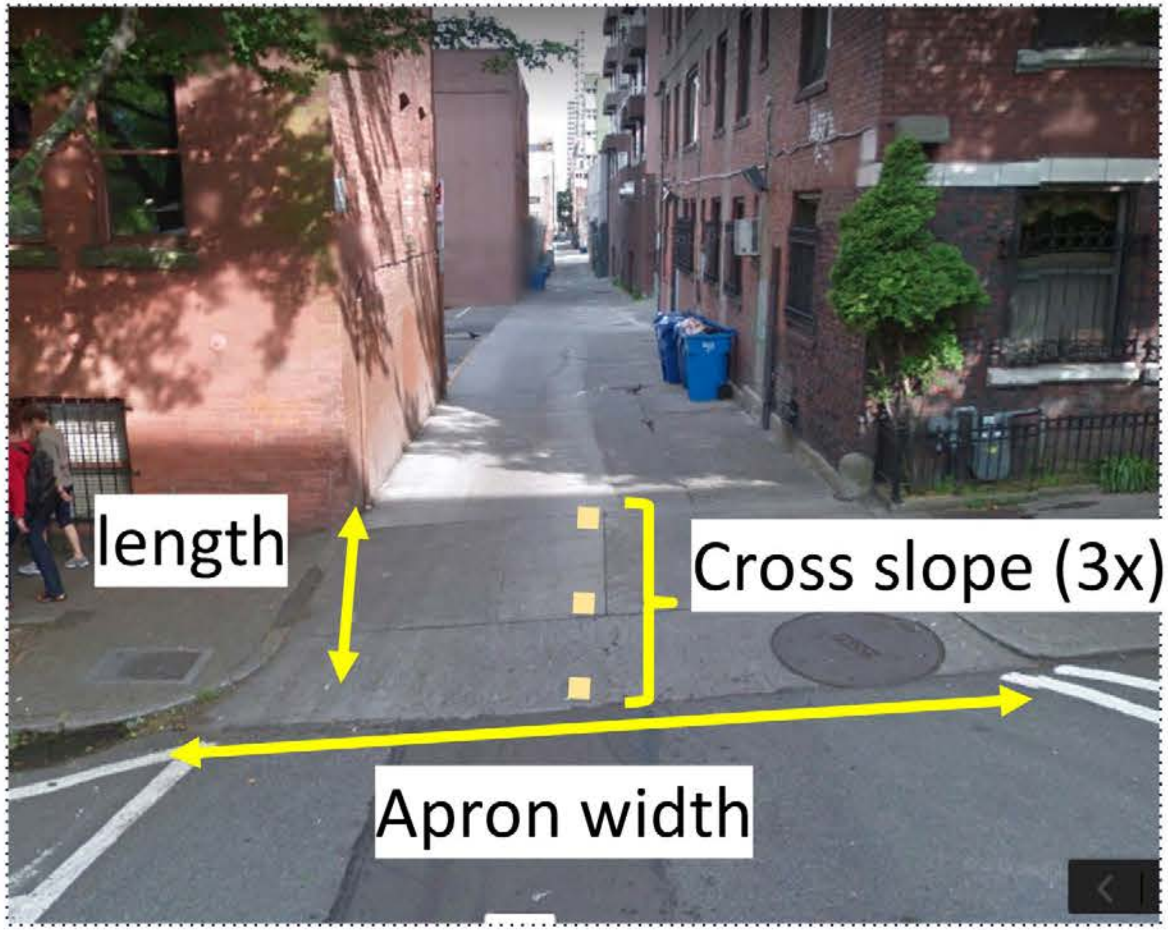
Step 3. Before entering the alleyway

Step 4. Within the alleyway

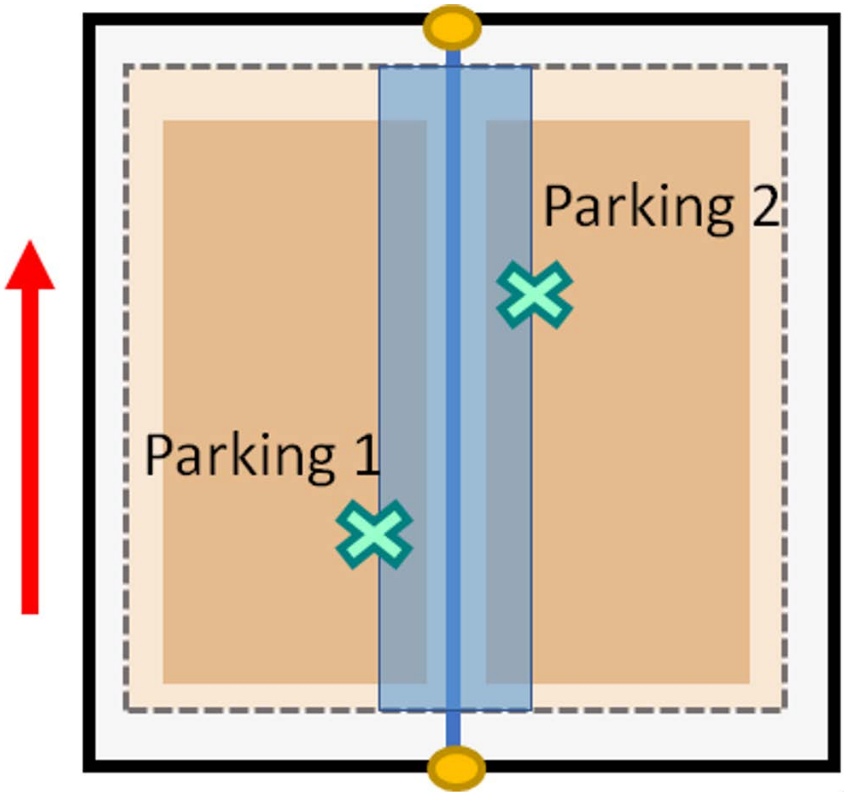
Step 5. Alleyway's "Extreme Point"

Features at the extreme point - D. Apron





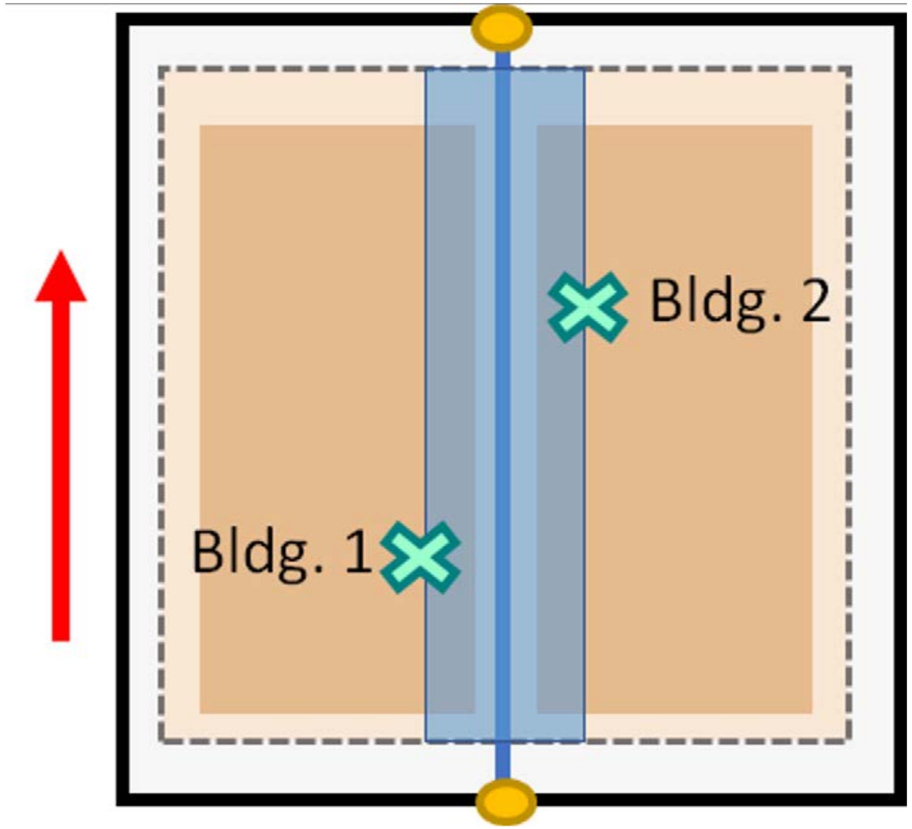
B. Parking facilities



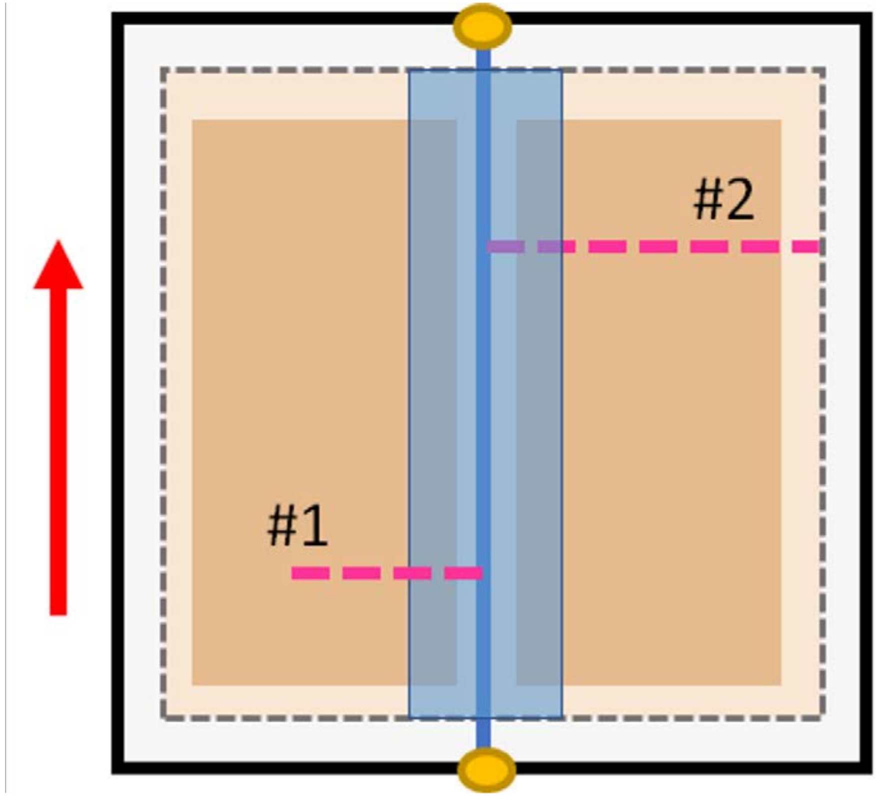
Features to be collected:

- **Geolocation**
- Distance from start of alley
- Pictures

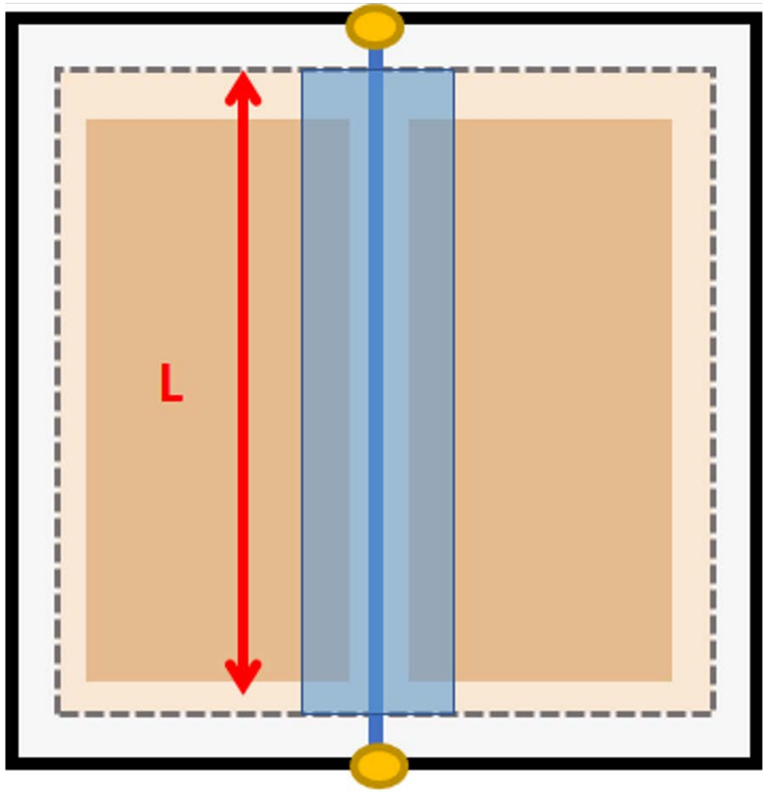
C. Main entrances to buildings



D. Driveways



E. Alleyway Length



L = Alleyway total length

We will measure total length of alleyway with a measuring wheel

F. Pavement Conditions

Pavement in bad conditions shows:

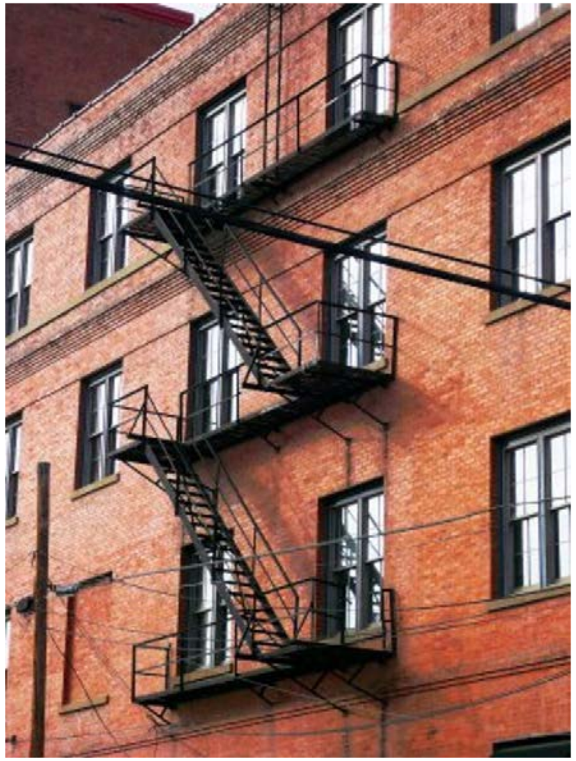
Uplift or Faulting

Settling

Non-flush Utility vaults

wa

G. Count of obstructions



Fire escapes

Garbage bins or cans

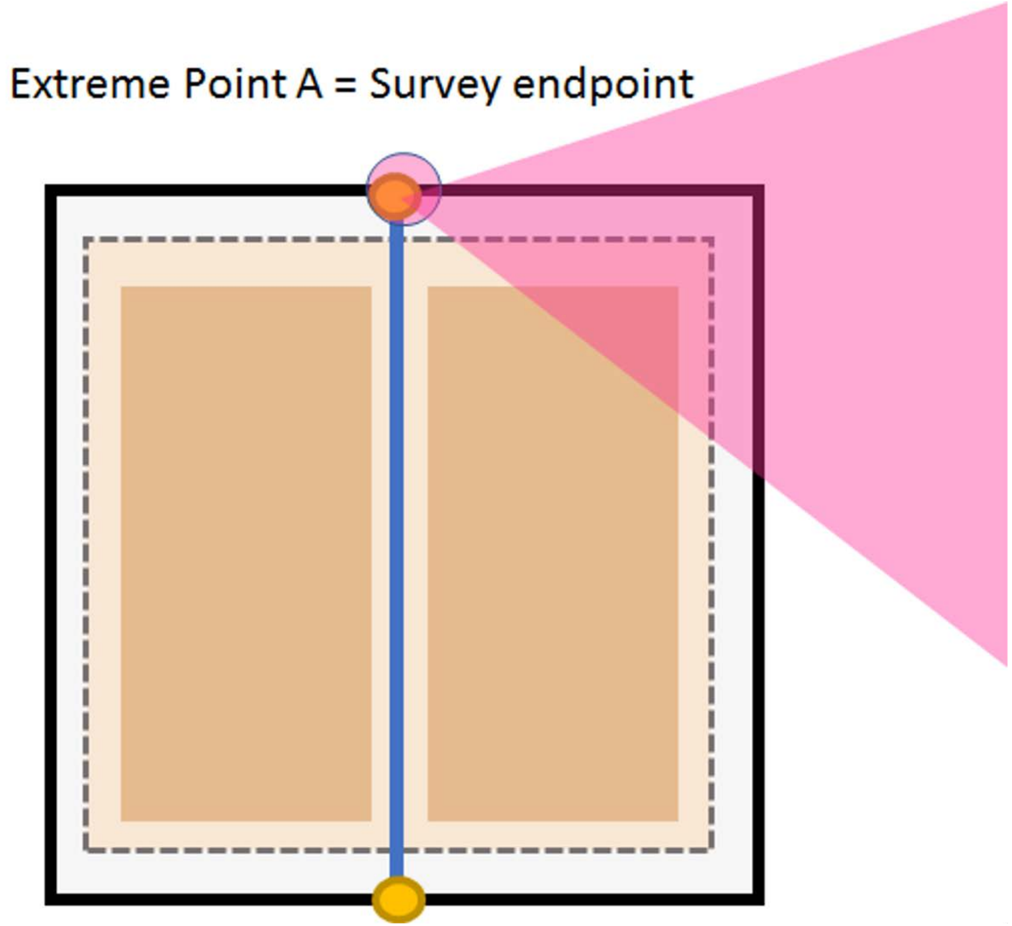
Garbage bins or cans for oil

H. Presence of temporal obstructions

Debris

Street Furniture

Features at the extreme point - Survey endpoint



We will collect :

A. **Geolocation**
B. Width within 30ft. Into the alley
C. Street name closest to extreme point
D. Apron features

Note: (depending on extreme point category)

Save the date!

- **Friday, January 5:**
  Submit your Winter Quarter availability
- **Before Monday, January 15**:
  Attend training session in field, specific time to be defined
  Attend training session in data cleaning session in office, specific time to be defined
- **Before appointment of training in-field:**
  Self-review the materials of theoretical training session

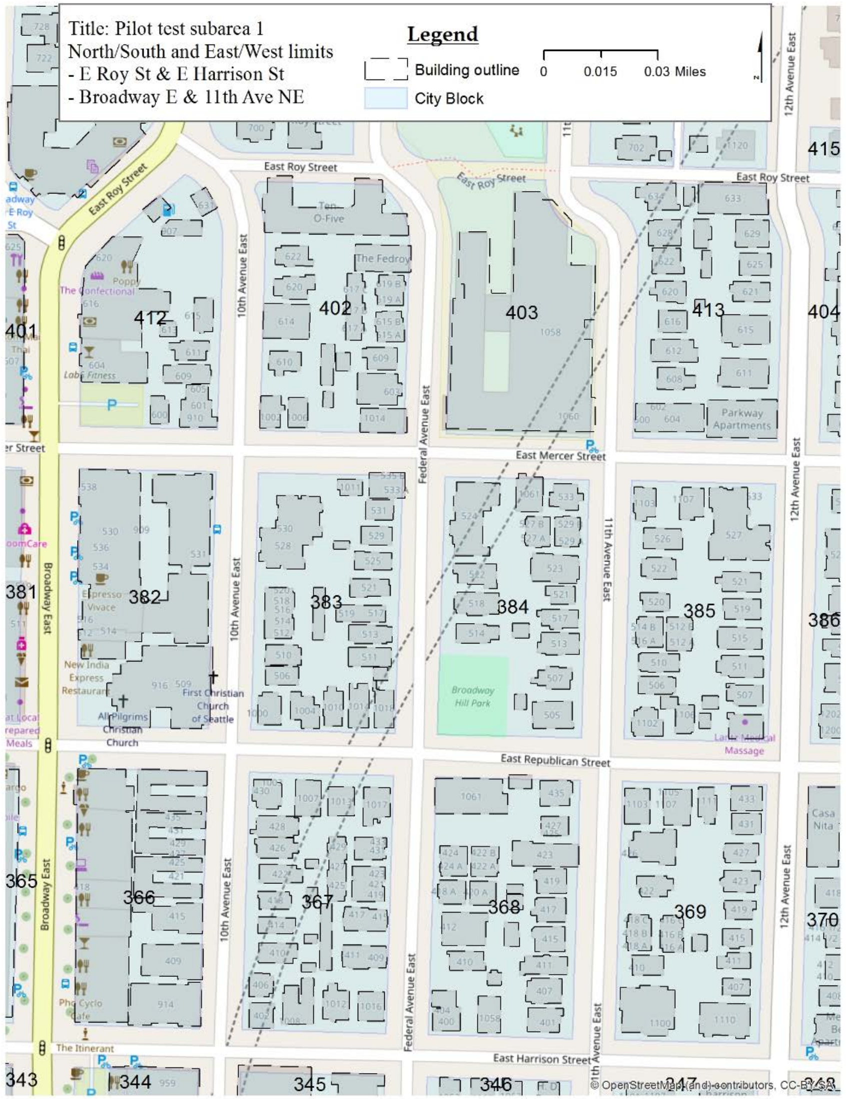
Communication

City Block Round

Data collectors will do a city block round before starting any survey in a new city block. During the round, they will indicate the following information on the hard copy map:

→ Access points width

→ Access points location



Data Quality Process: In field

Keep track of the surveyed alleyways!

- Thoroughly inspect every city block in the assigned map and do not leave spaces behind where you did not walk
- Progressively fill the map with the alleyways collected in field

Always be aware of your location!

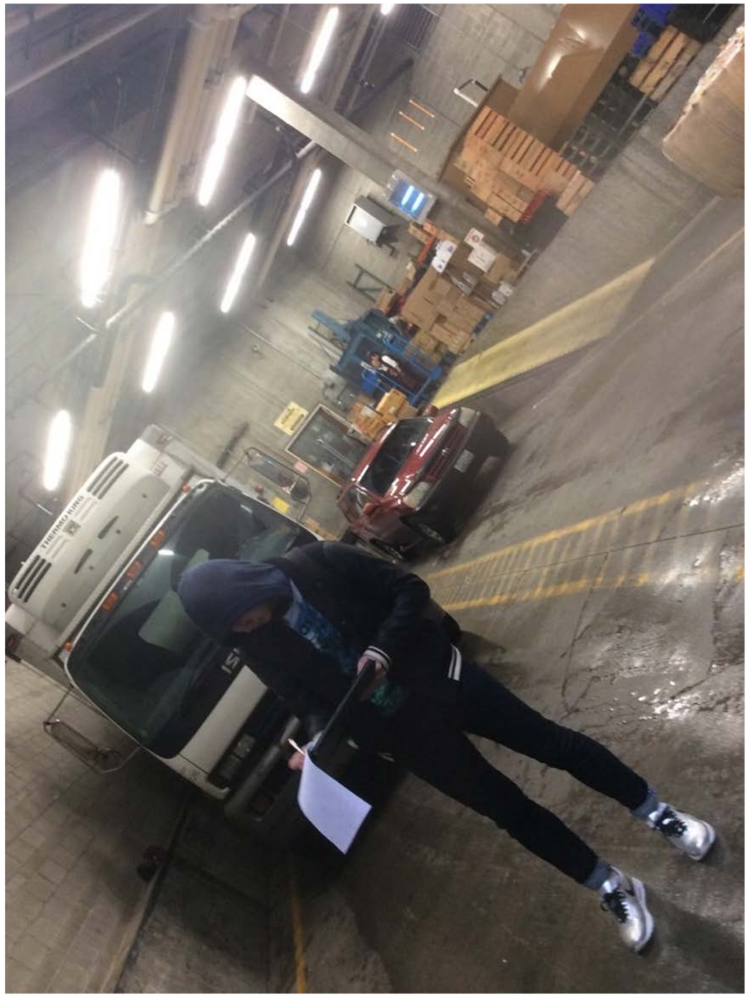
- Orient yourself and be confident about your location before starting a new survey

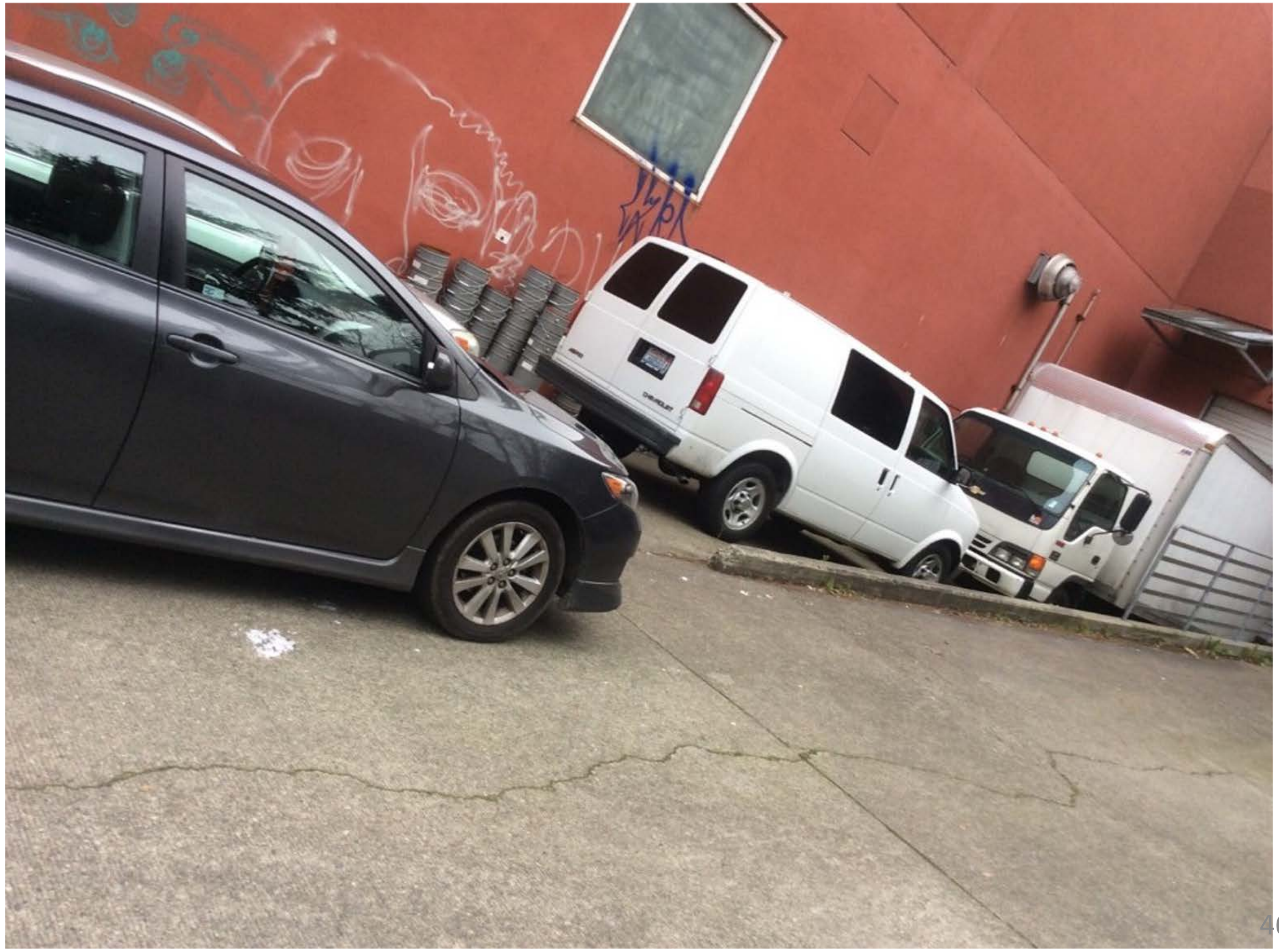
Be careful collecting the data!

- Correctly collect GPS readings
- Correctly collect the measuring wheel readings
- Collect clear and useful pictures, these are key for quality control.

Note: If you have any questions, refer to training materials or contact us

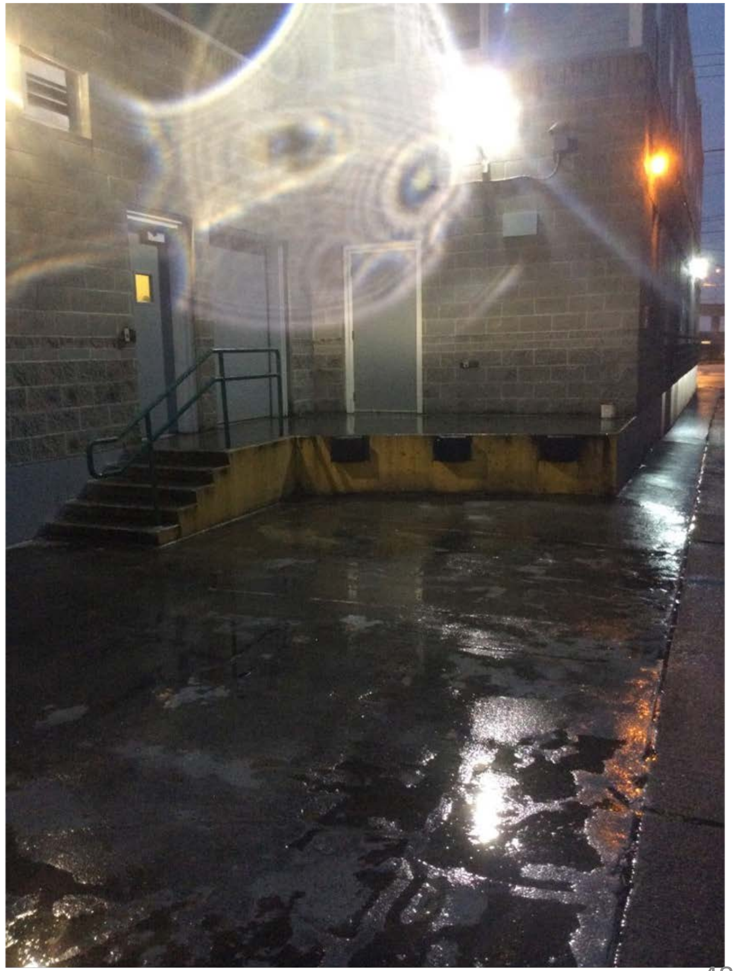
Data Quality Control:
"Don'ts" of taking pictures (Weird angles)



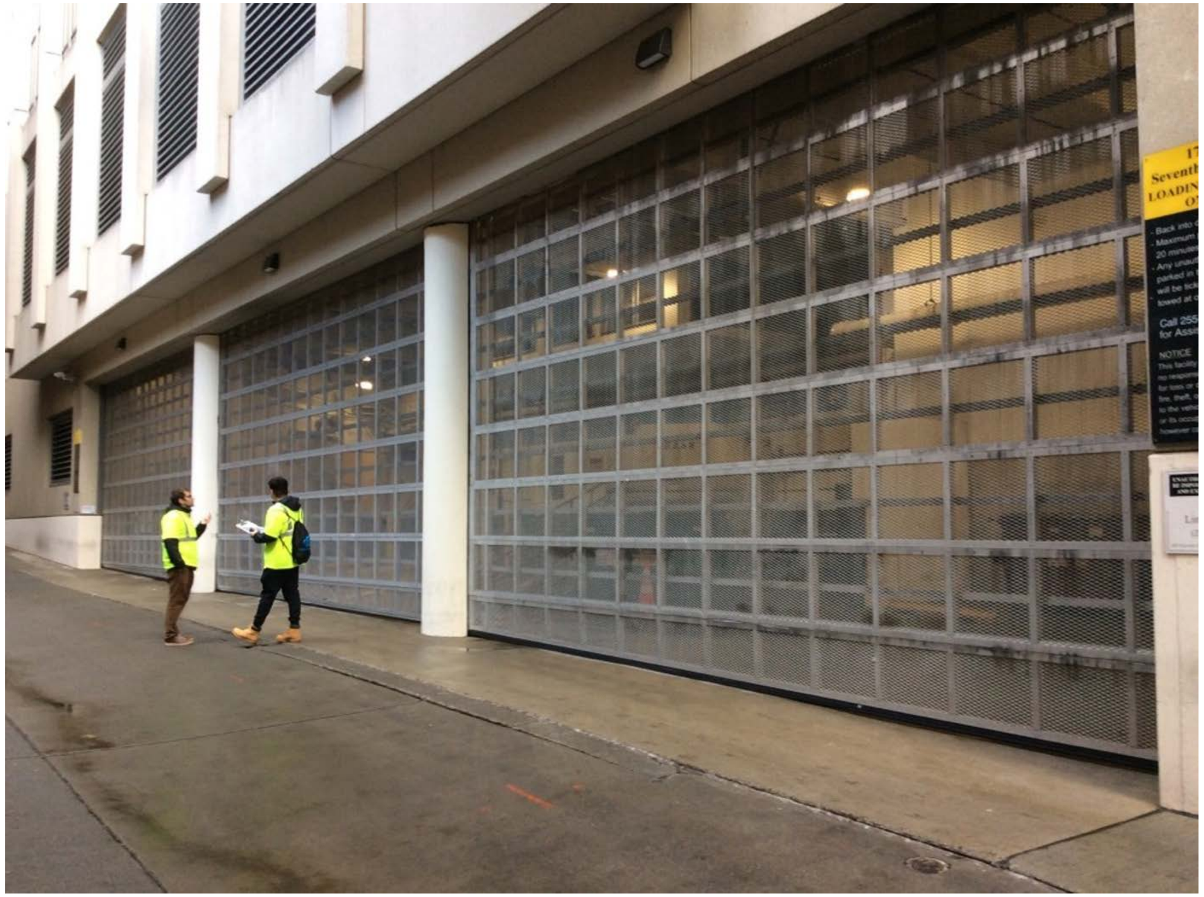


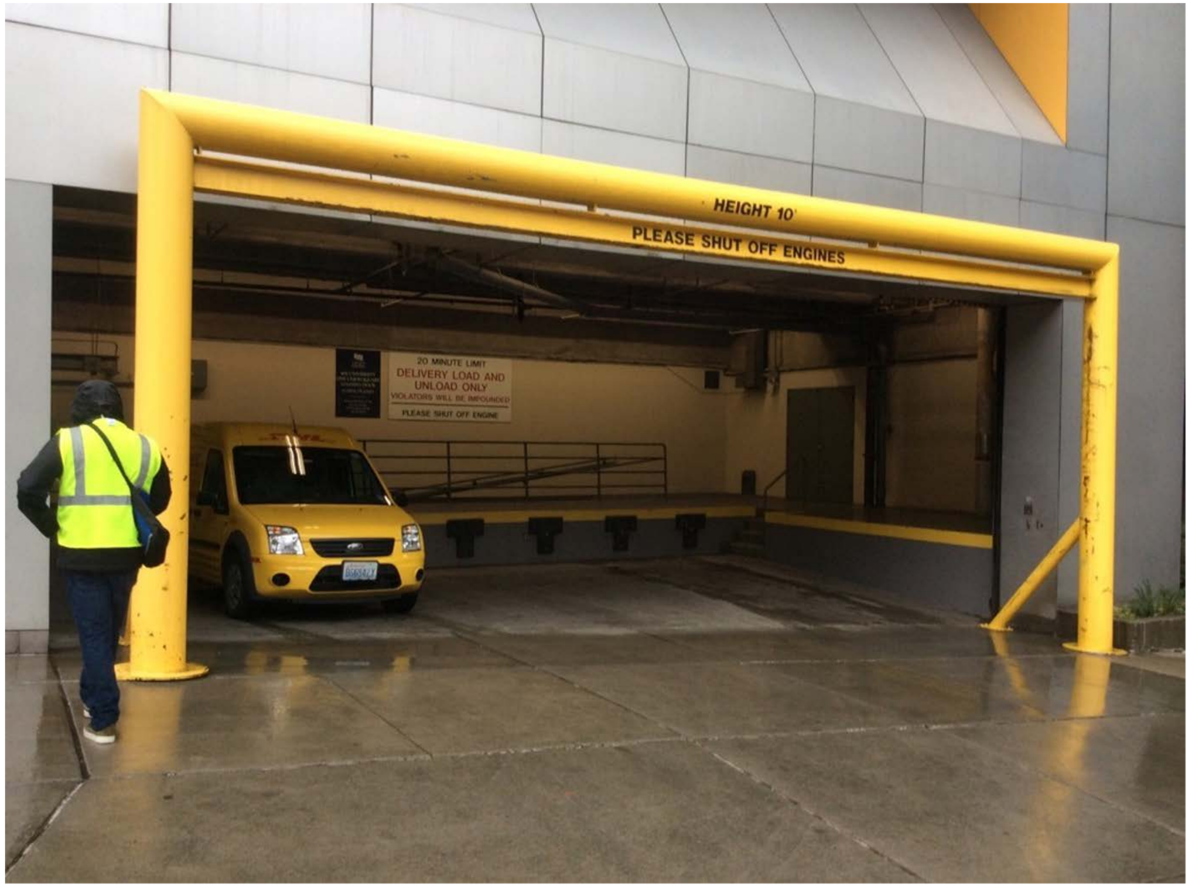
Data Quality Control:
“Don’ts” of taking pictures (No context)

Data Quality Control:
“Don’ts” of taking pictures (Lack of clarity)

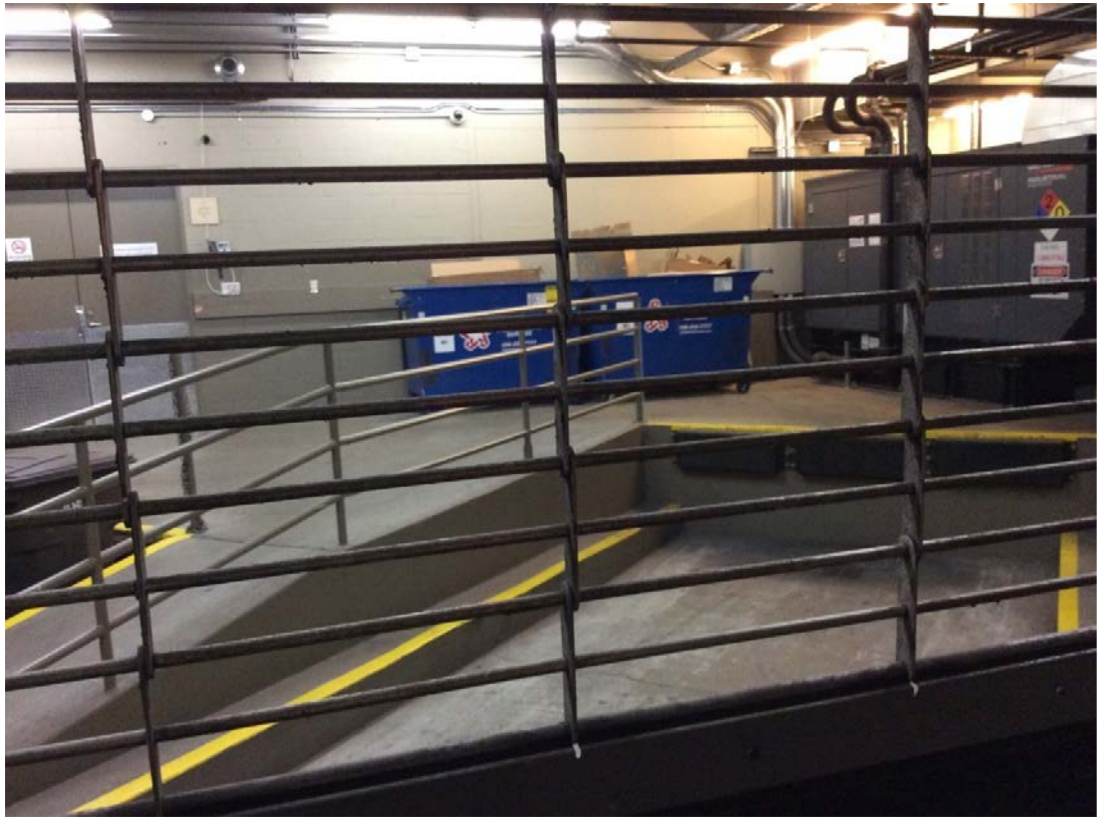


Data Quality Control:
“Dos” of taking pictures (enough context)





Data Quality Control:
Dos of taking pictures
(important additional details)



Data Quality Process:
In office

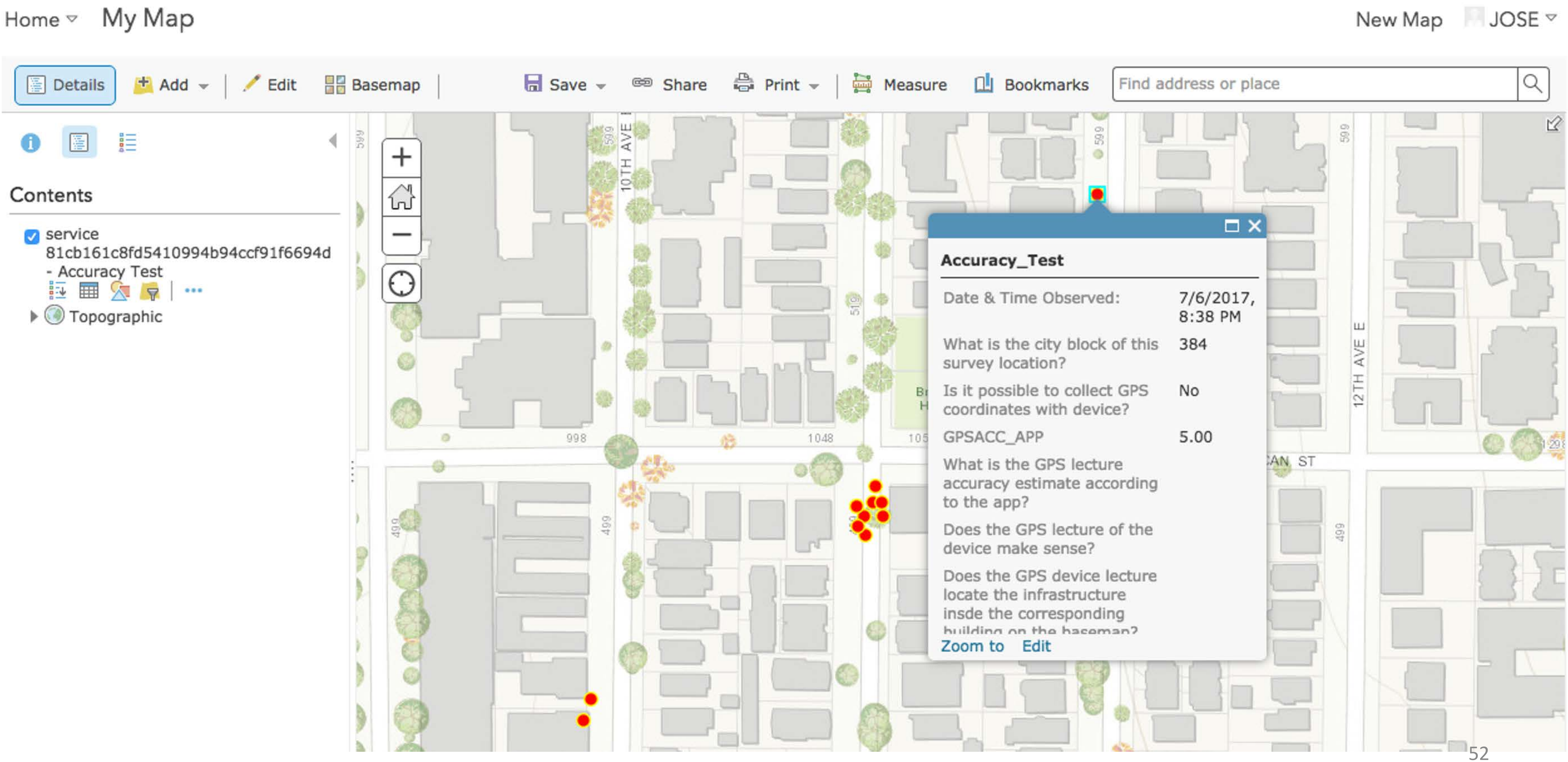
After every data collection shift one member of the team is responsible for the following task:

Task 1 - Review geopoints
- Extreme points
- Loading bays
- Parking facilities

Task B - Review remaining features collected of each survey.

Note: *Data collectors will follow a Data quality process manual.*

Data Quality Control: Online ESRI platform



Data Cleaning Manual

Final 50 Feet Project - Alley Inventory
January 21, 2018

How to use this manual?

Data collectors may follow this step-by-step guide on how to use ArcGIS Online (AOL) for data cleaning.

After every data collection shift one member of the team is responsible for:

- **submitting** the surveys conducted that day and
- completing data cleaning of the **submitted data** no later than 24 h after data collection.

Submit data cleaning report

After every data cleaning appointment, submit the following information by posting a message in our team facebook group:

- Picture of your base map clearly showing the city blocks that you inspected
- Last Survey ID on your basemap
- Number of surveys that you did that day of data collection
- Team members names
- Your RA supervisor for that data collection appointment

Facebook group:
[SCTL WQ18 Data Collection] - Task Order 4 - Alley's Project

What do we mean with data cleaning?

Involves the following types of edits:

1. Geolocation of alley features:
   a. Start and end extreme points
2. Alley information:
   a. Missing surveys
   b. Name of streets
   c. Block face of city block
3. Link with other databases:
   a. Wrong alley's TNET ID
   b. Wrong freight parking infrastructure ID

How to access the database in AOL?

First, you need to log in AOL through the UW enterprise URL with your UW netID.

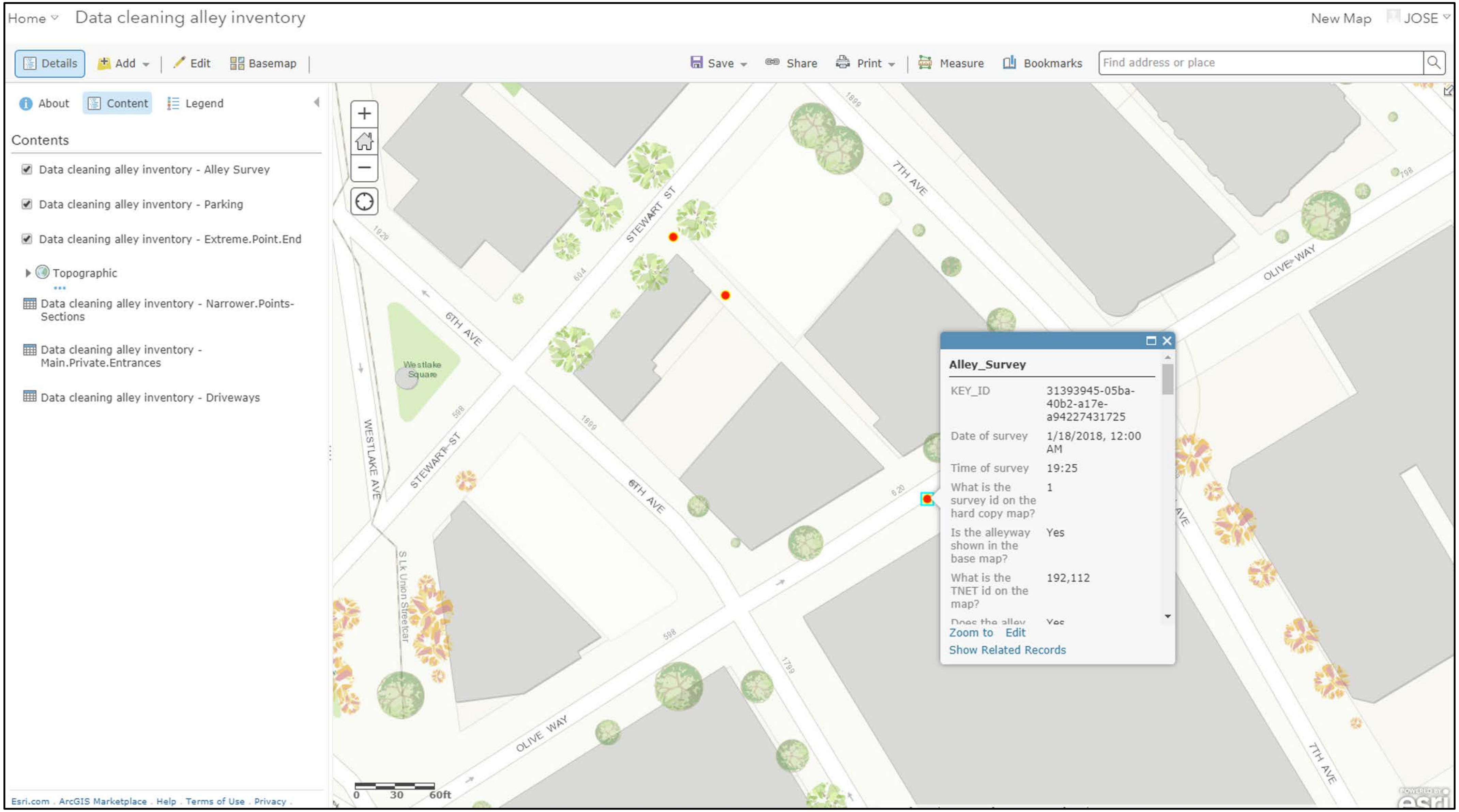
If you do not know how to log in AOL with your UW netID, use the following link:

How to access the database in AOL?

We will use a hosted feature layer in AOL to edit the data. The feature layer can be access through the following link:

Alley Survey Hosted Feature Layer

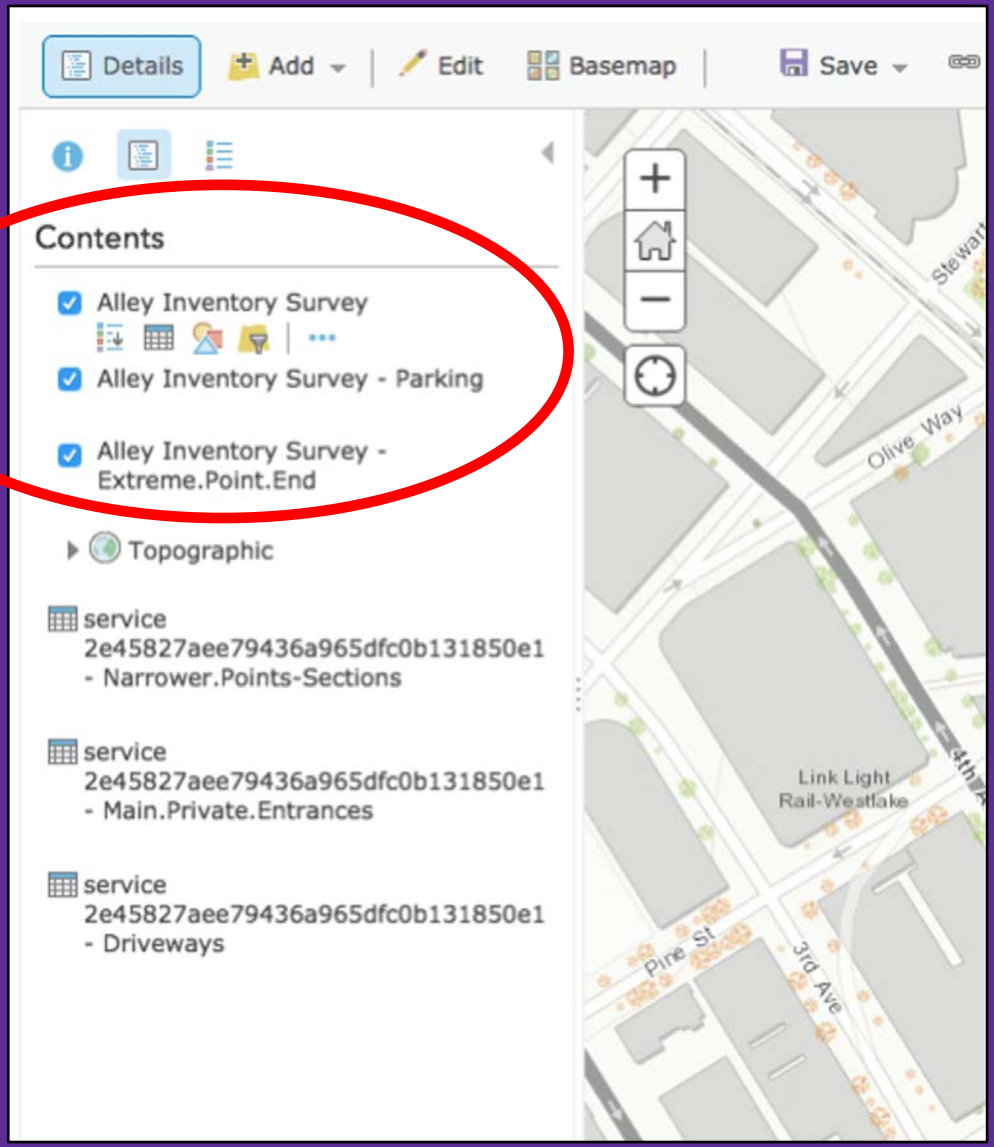
Editor view


Home
Data cleaning alley inventory
New Map
JOSE
Details
Add
Edit
Basemap
Save
Share
Print
Measure
Bookmarks
Find address or place
About
Content
Legend
Contents
Data cleaning alley inventory - Alley Survey
Data cleaning alley inventory - Parking
Data cleaning alley inventory - Extreme.Point.End
Topographic
Data cleaning alley inventory - Narrower.Points-Sections
Data cleaning alley inventory - Main.Private.Entrances
Data cleaning alley inventory - Driveways
Alley_Survey
KEY_ID 31393945-05ba-40b2-a17e-a94227431725
Date of survey 1/18/2018, 12:00 AM
Time of survey 19:25
What is the survey id on the hard copy map? 1
Is the alleyway shown in the base map? Yes
What is the TNET id on the map? 192,112
Zoom to Edit
Show Related Records
STEWART ST
7TH AVE
6TH AVE
OLIVE WAY
WESTLAKE AVE
Westlake Square
S Lk Union Streetcar
0 30 60ft
Esri.com . ArcGIS Marketplace . Help . Terms of Use . Privacy .

Panel Contents

Point features in the panel:

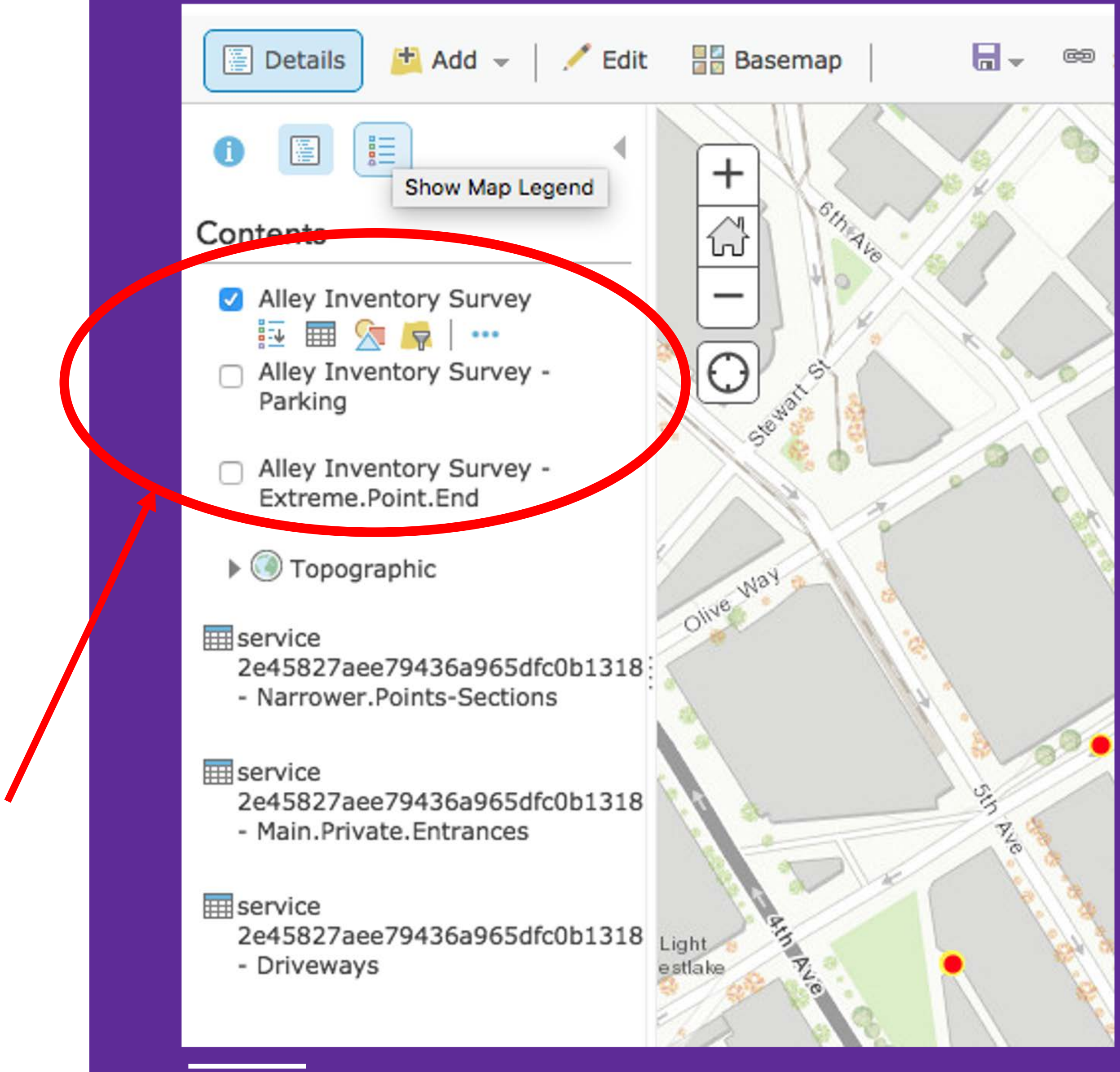
1. Extreme point start
2. Parking
3. Extreme point end



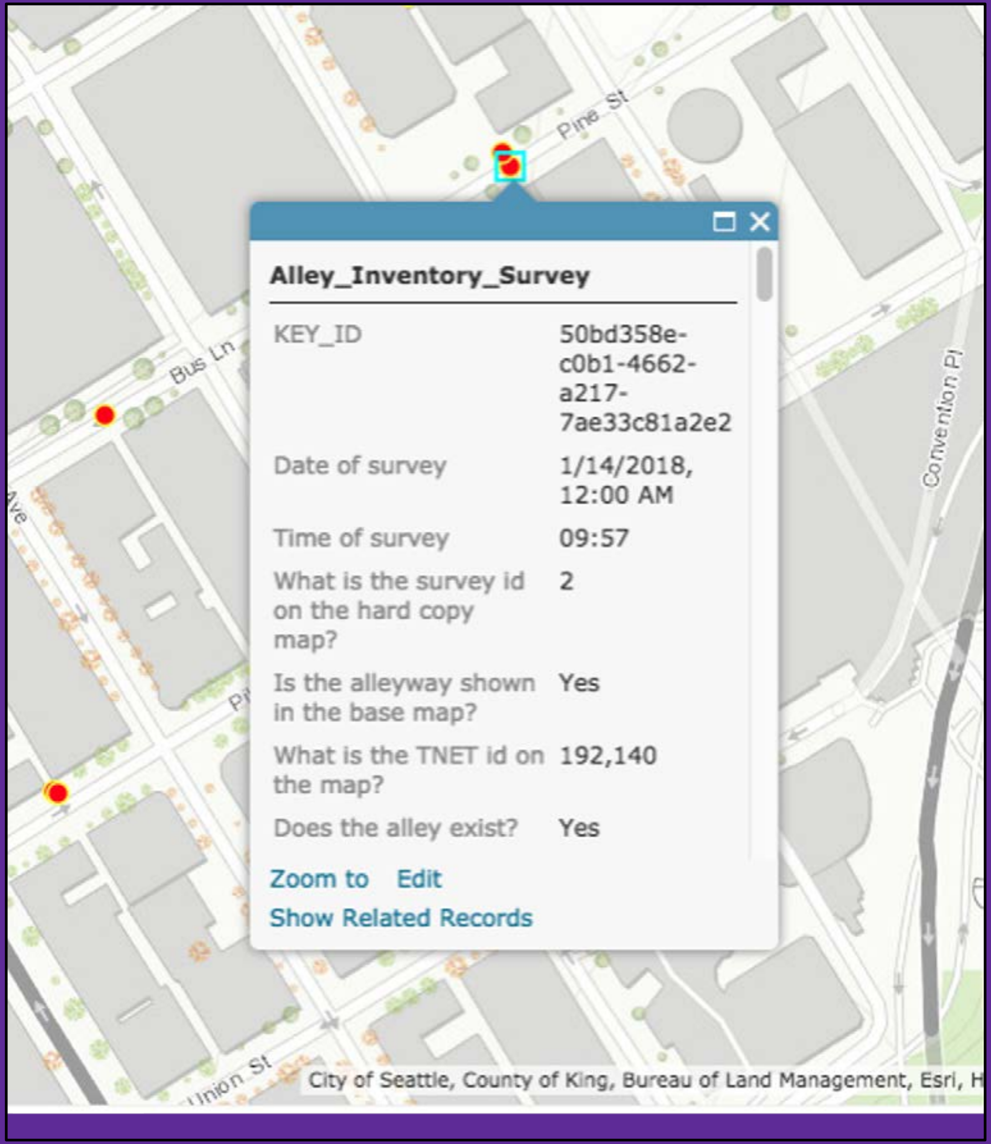
Panel Contents

Point features in the panel:

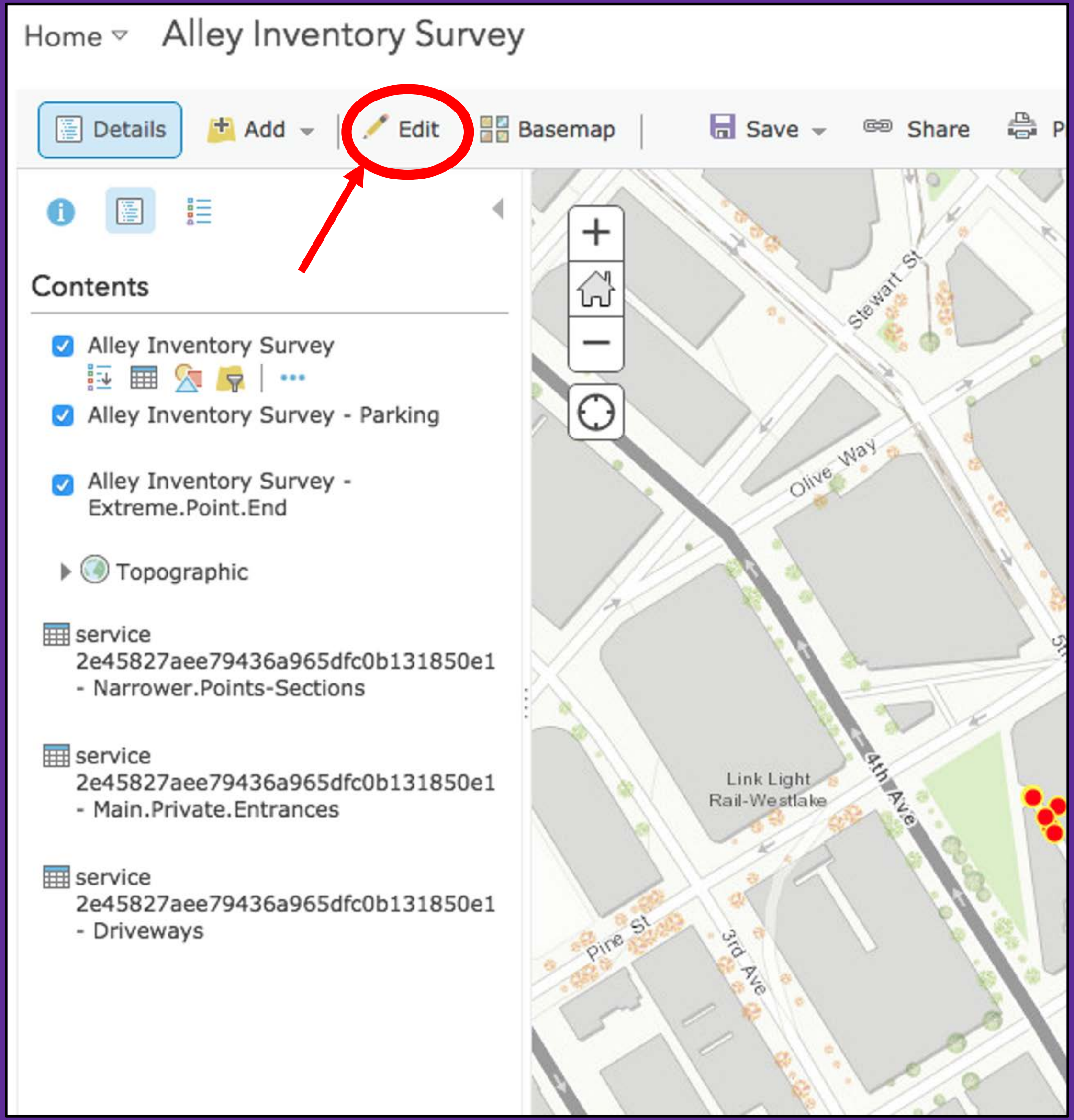
1. Extreme point start
2. Parking (turn off)
3. Extreme point end (turn off)



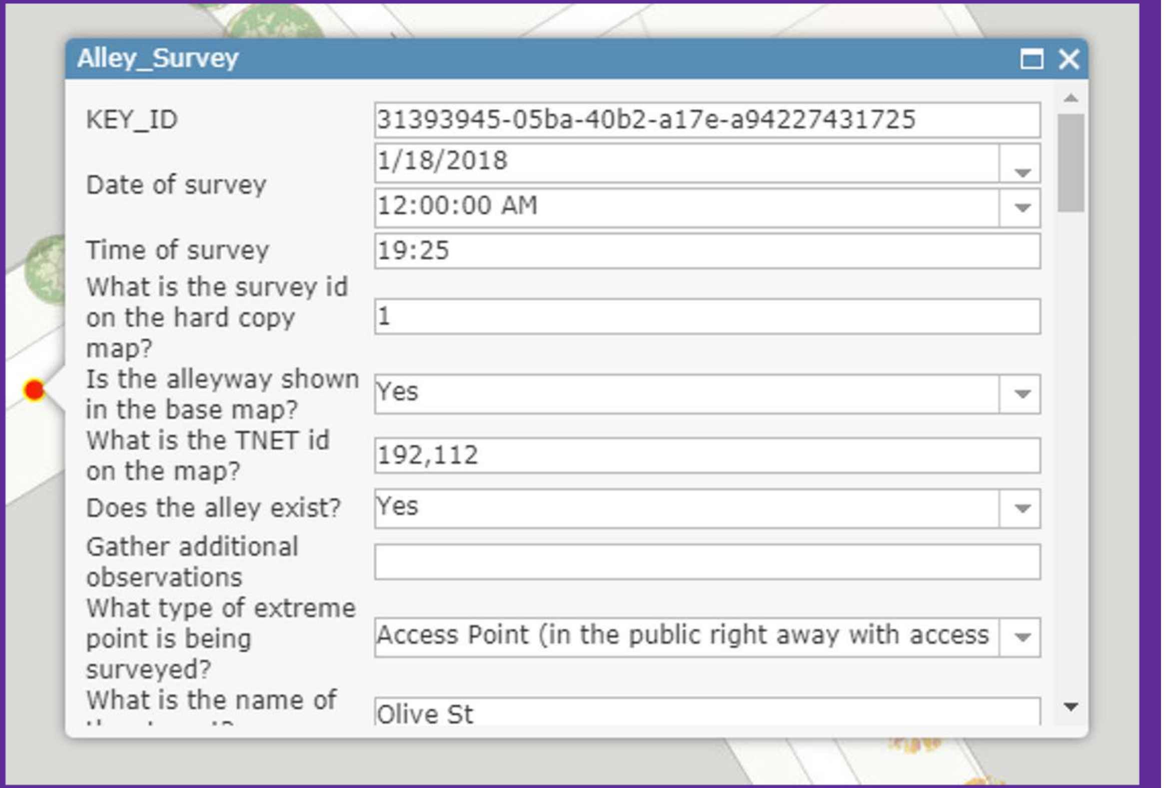
Feature information panel



Start edition mode



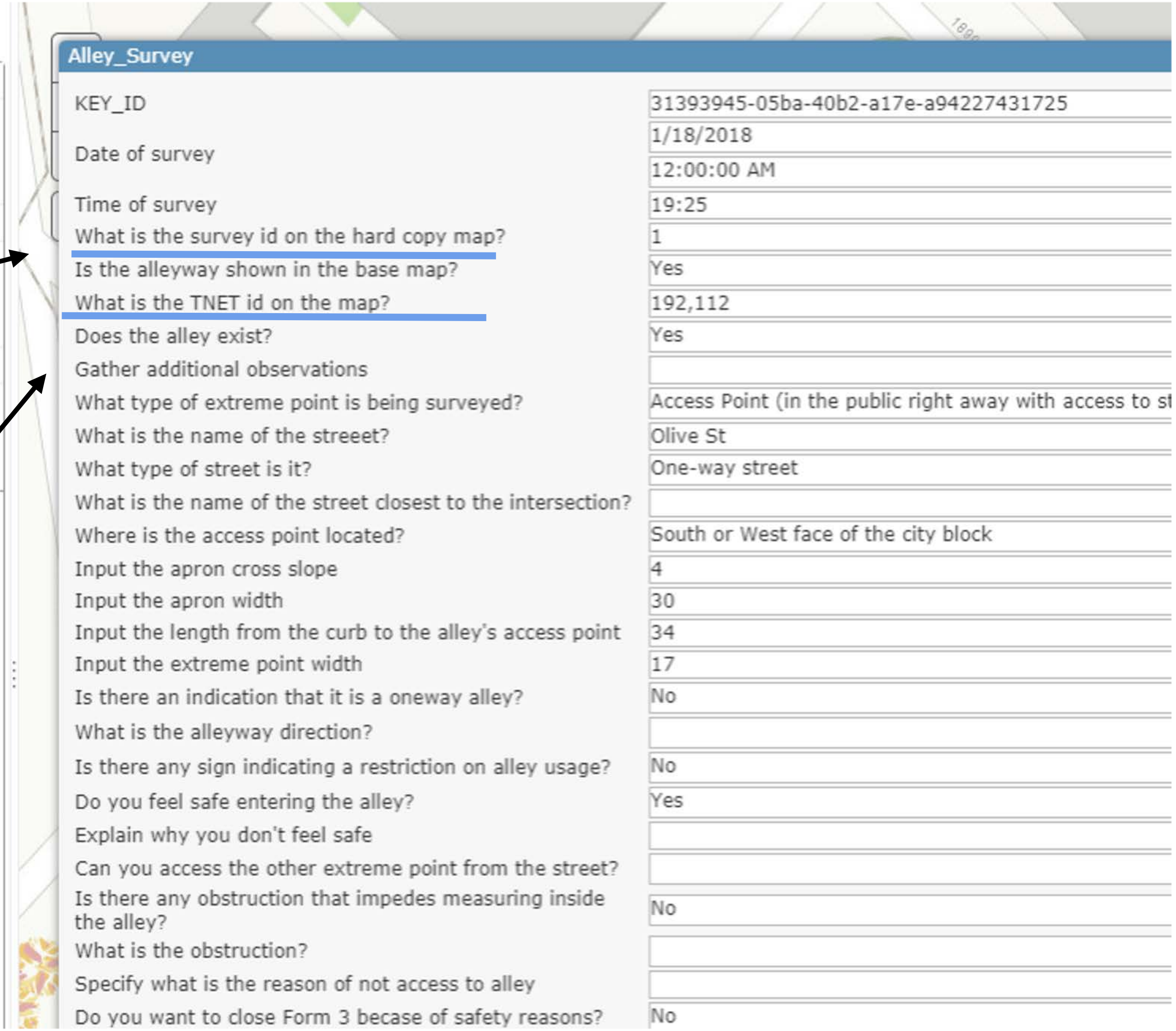
Review of start extreme point



Review of
<u>start extreme point</u>

- Chose a **Survey ID** on your hard copy map. Is the survey in AOL?

- Is the **alley´s TNET ID** correct?
  Remember: If the alley is not shown in the basemap TNET ID = 999



Alley_Survey

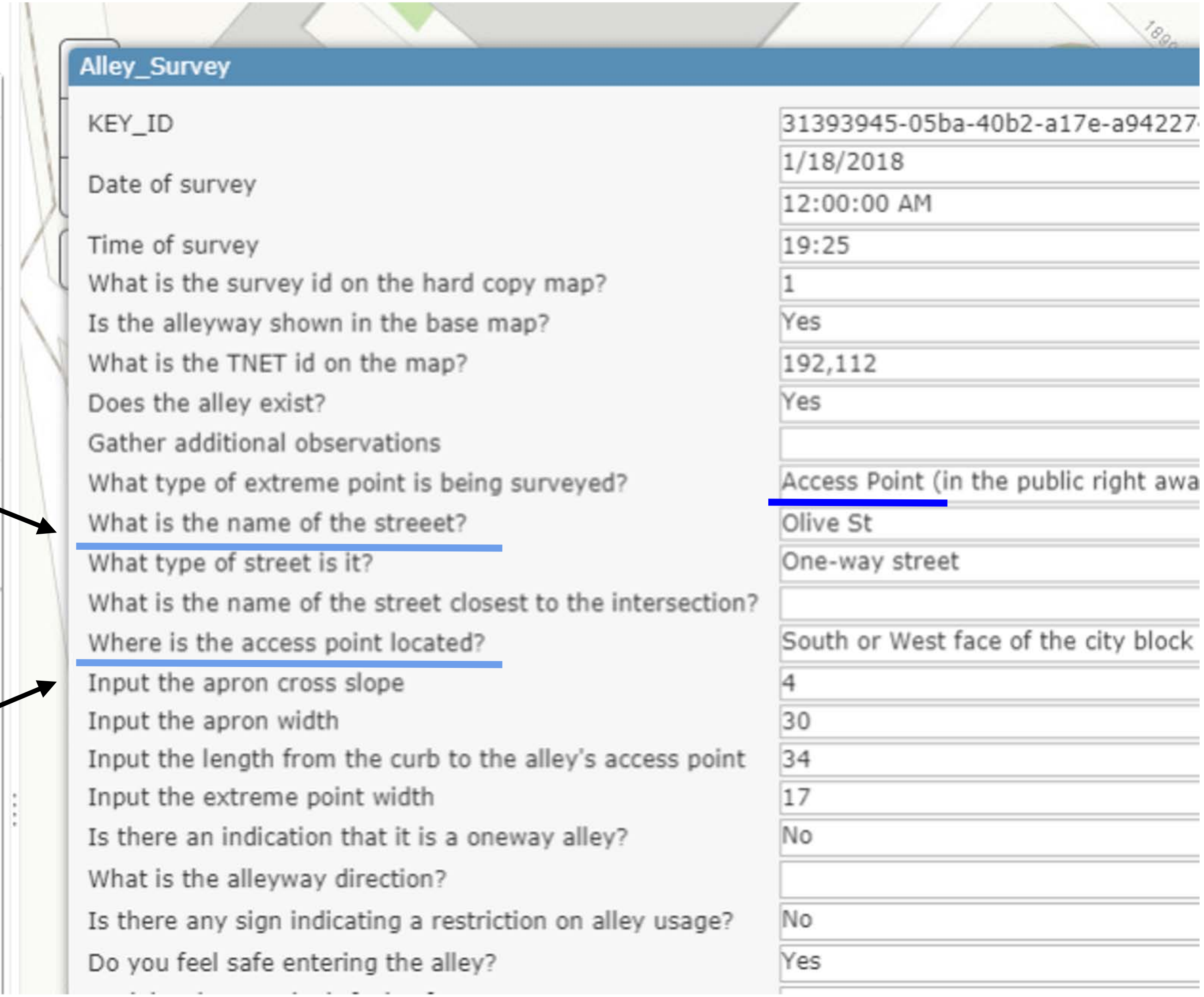
KEY_ID	31393945-05ba-40b2-a17e-a94227431725
Date of survey	1/18/2018
	12:00:00 AM
Time of survey	19:25
What is the survey id on the hard copy map?	1
Is the alleyway shown in the base map?	Yes
What is the TNET id on the map?	192,112
Does the alley exist?	Yes
Gather additional observations	
What type of extreme point is being surveyed?	Access Point (in the public right away with access to st
What is the name of the streeet?	Olive St
What type of street is it?	One-way street
What is the name of the street closest to the intersection?	
Where is the access point located?	South or West face of the city block
Input the apron cross slope	4
Input the apron width	30
Input the length from the curb to the alley's access point	34
Input the extreme point width	17
Is there an indication that it is a oneway alley?	No
What is the alleyway direction?	
Is there any sign indicating a restriction on alley usage?	No
Do you feel safe entering the alley?	Yes
Explain why you don't feel safe	
Can you access the other extreme point from the street?	
Is there any obstruction that impedes measuring inside the alley?	No
What is the obstruction?	
Specify what is the reason of not access to alley	
Do you want to close Form 3 becase of safety reasons?	No

Review of
<u>start extreme point</u>

If extreme point =

access point

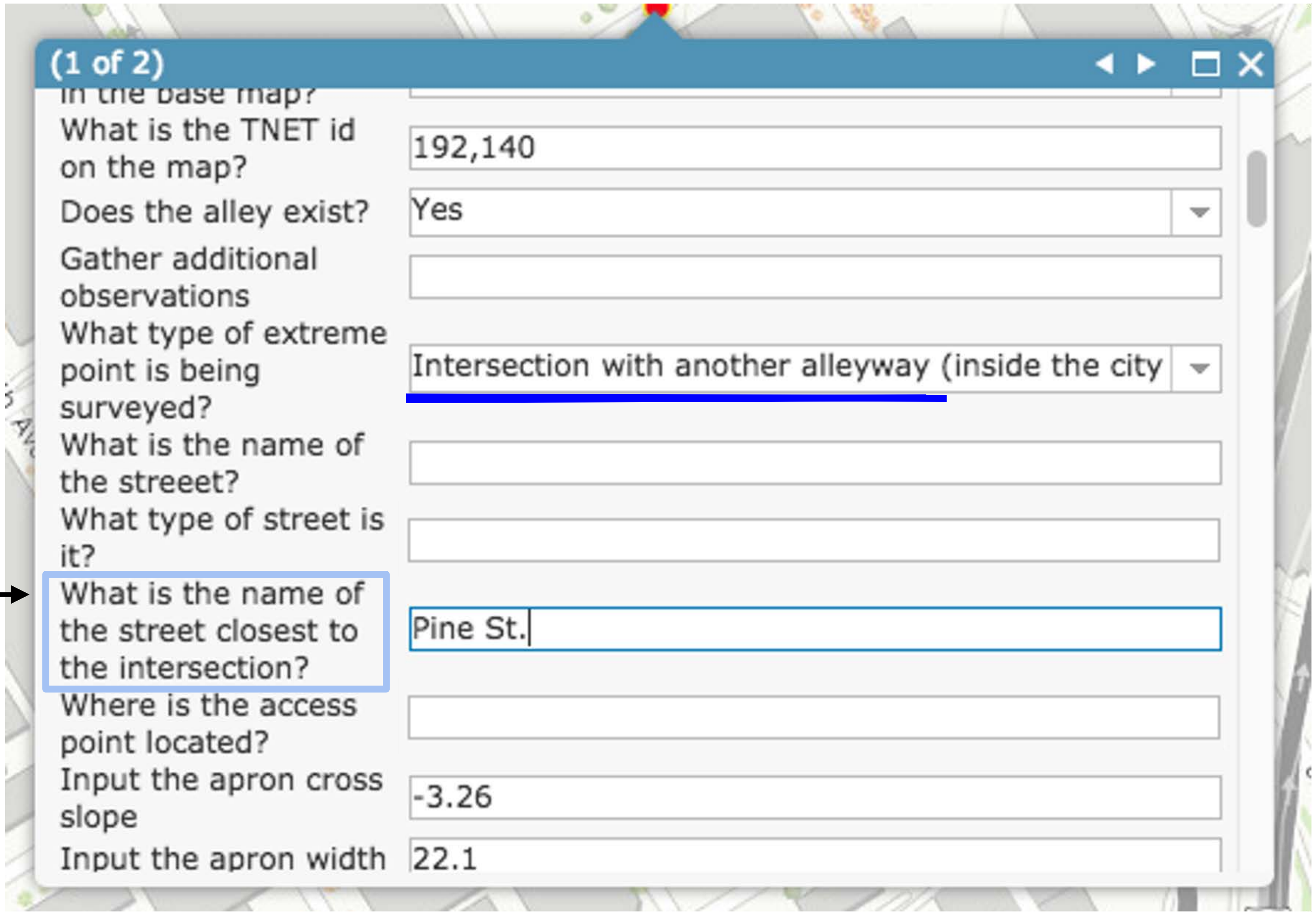
- Is the **name of the street** that you wrote in field correct?
- Did you correctly identified the city **block face** of the access point?



Review of
start extreme point

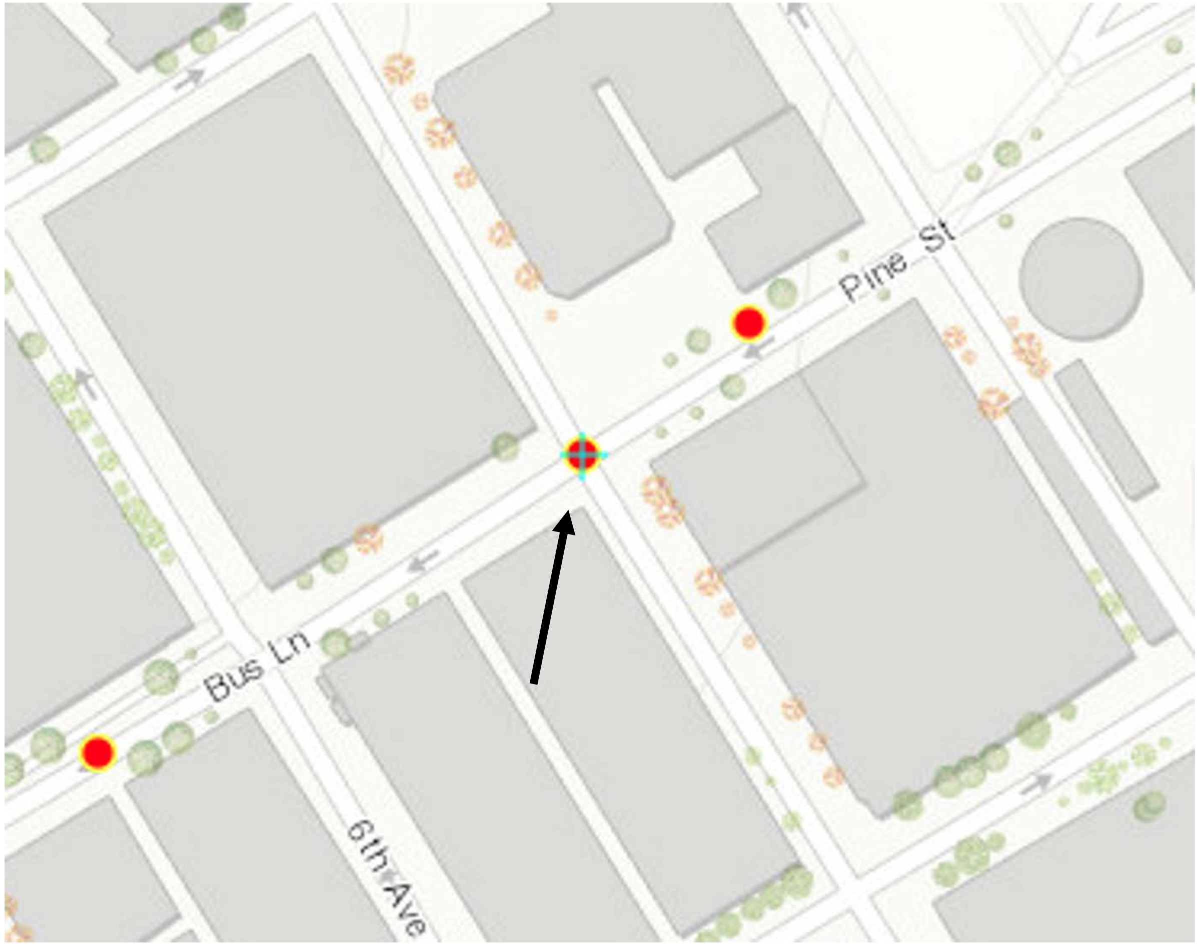
If extreme point =
intersection with another alley:

- Is the **name of the street** that you wrote in field correct?

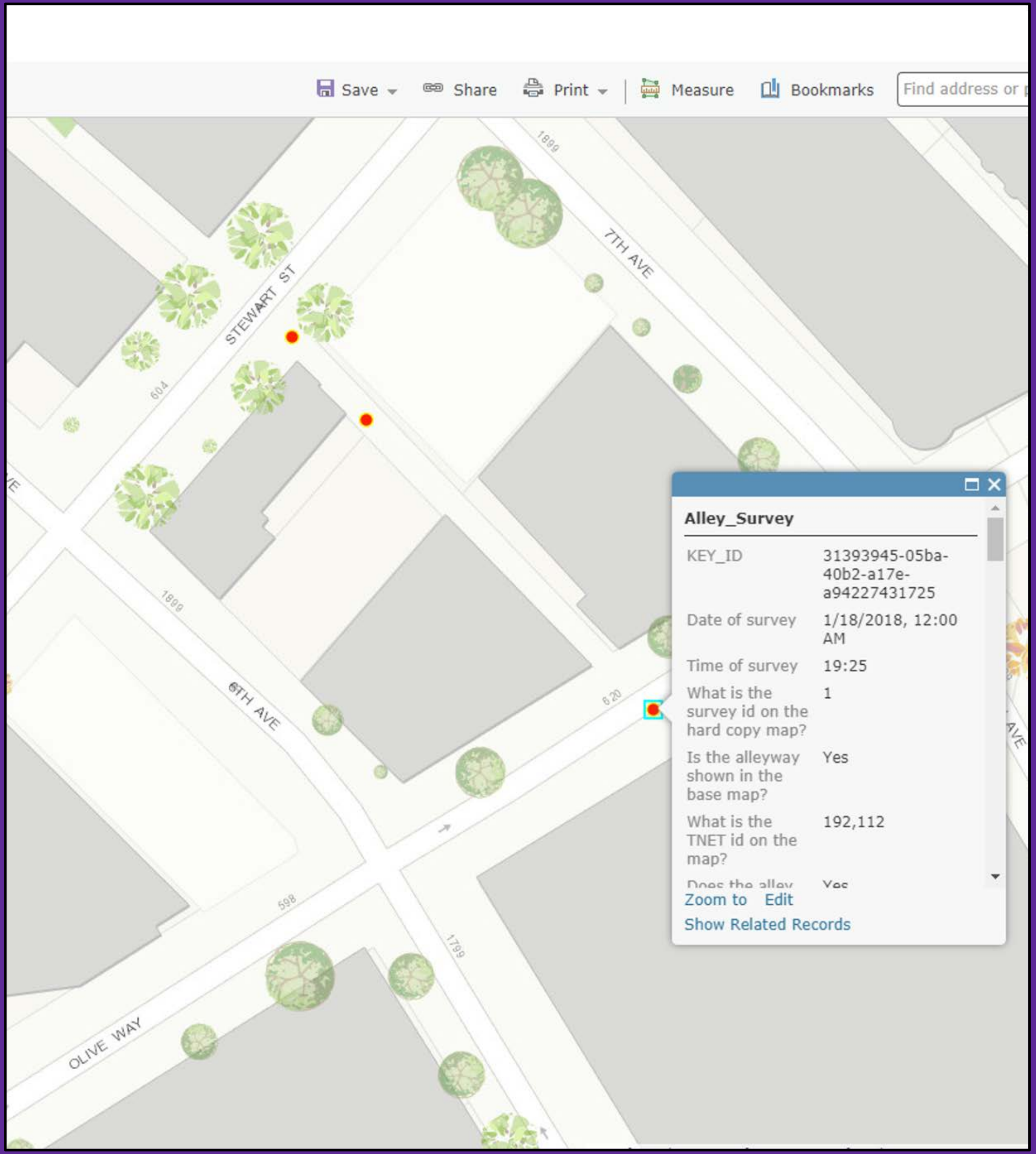


Review of
<u>start extreme point</u>

- Is the geopoint off or does not match what you have on the hard copy map filled in field?

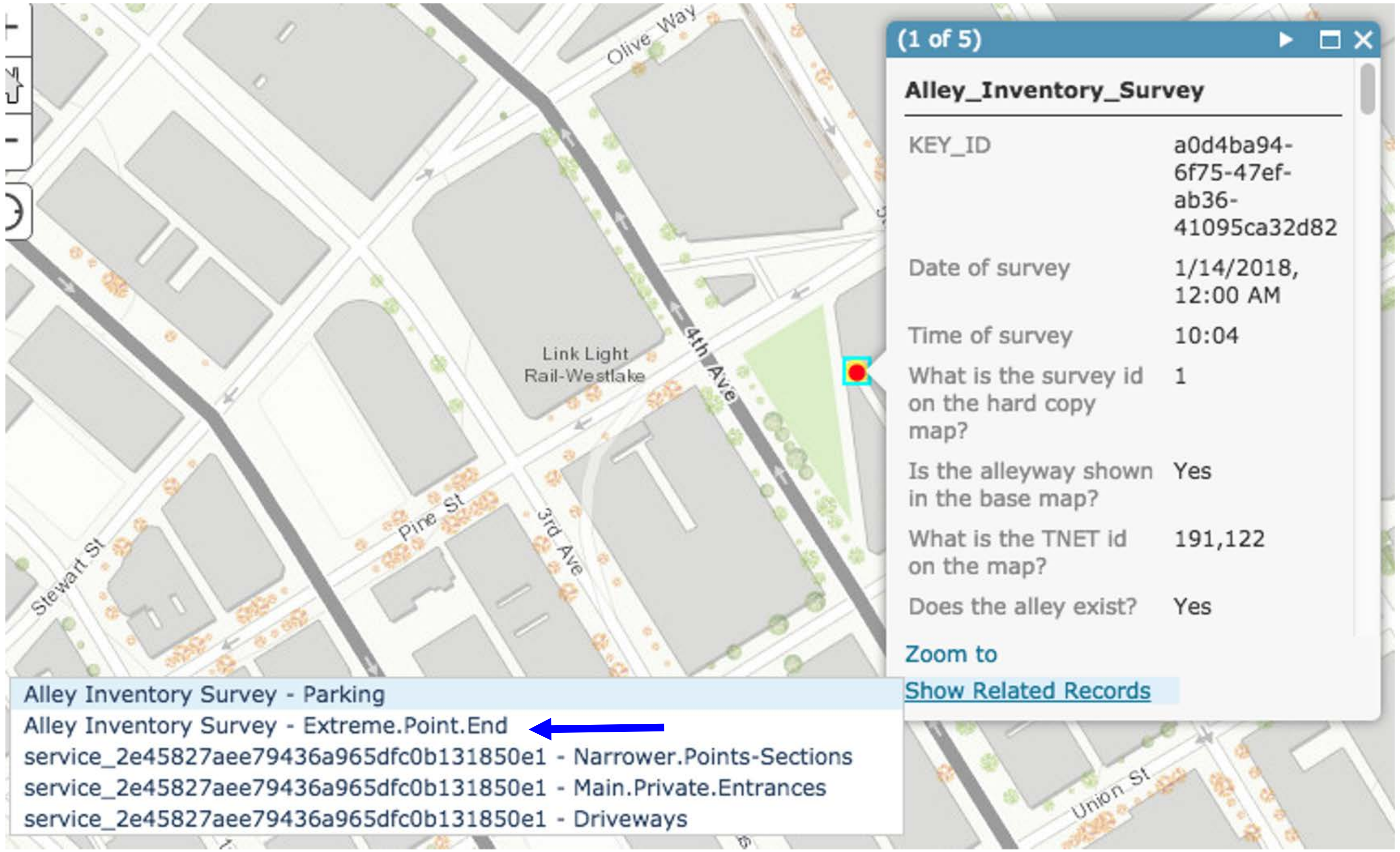


Review of end extreme point

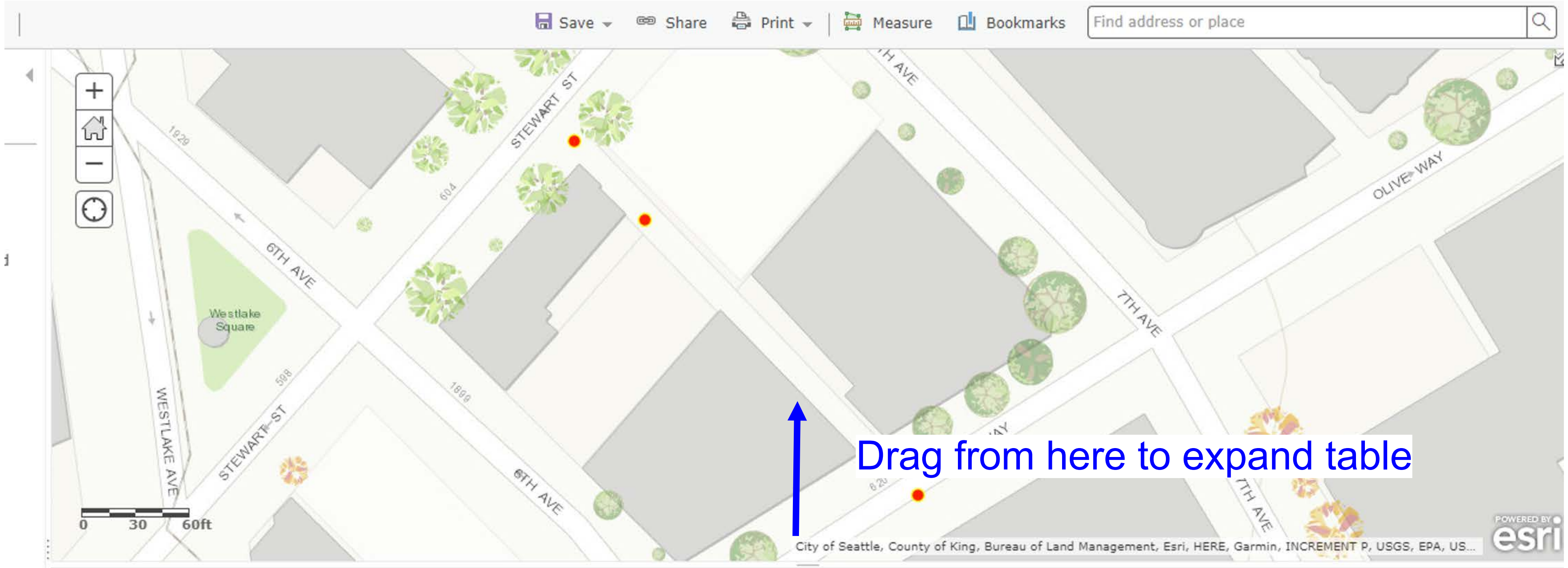


Access end extreme point table

1. Exit Edition mode
2. Access feature information panel of the survey
3. Click on Show Related Records -> Extreme.Point.End



Access end extreme point table



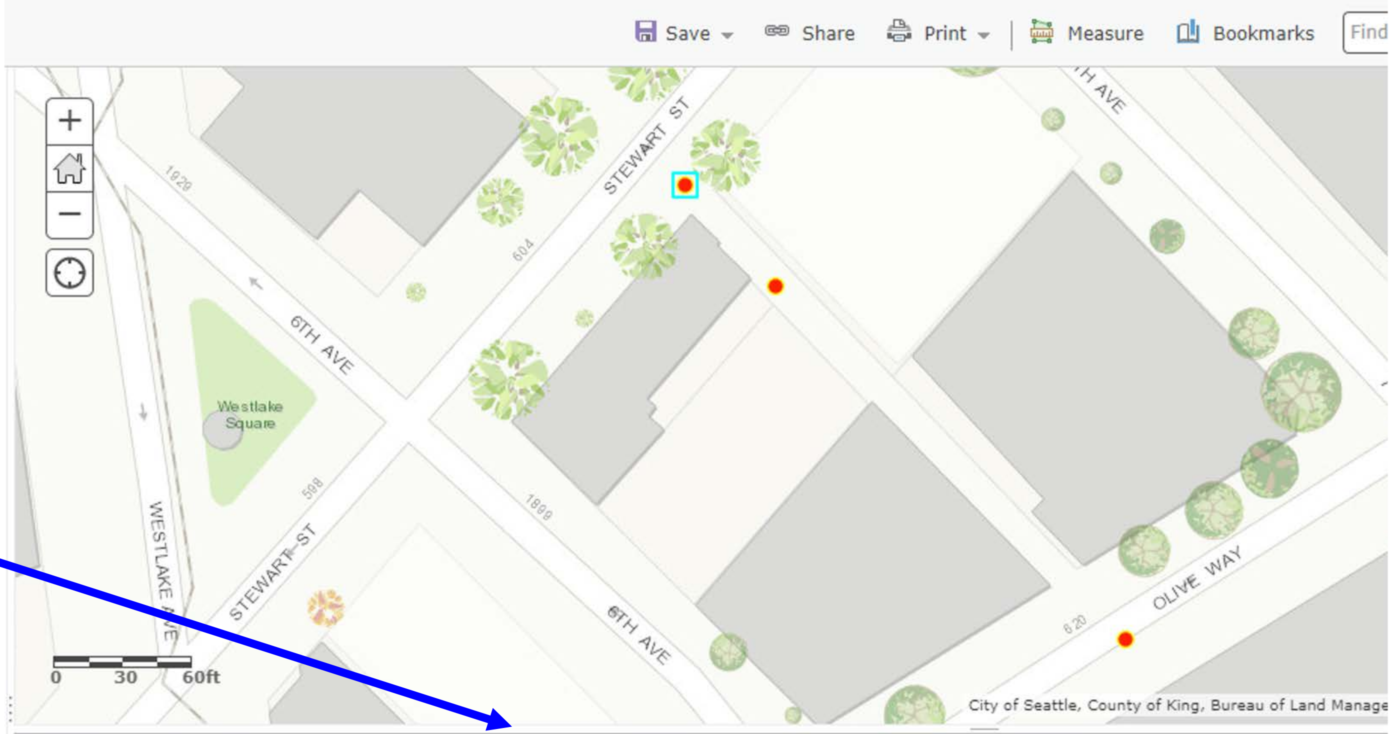
Data cleaning alley inventory - Extreme.Point.End (Features: 1, Selected: 0)

type of ne point is surveyed?	What is the name of the street closest to the alley's access point?	What type of street is it?	Input the length from the curb to the alley's access point	Where is the access point located?	Input the apron width	Input the apron cross slope	*Relationship_Main. Private.Entrances*	*Photos and Files*
ection with er alleyway the city block)	Stewart St.			North or East face of the city block			(1) Show	(0) Add

Review of
<u>end extreme point</u>

Once you can see the table Extreme.Point.End

- Is the **name of the street** that you wrote in field correct?
- Did you correctly identified the city **block face** of the access point?



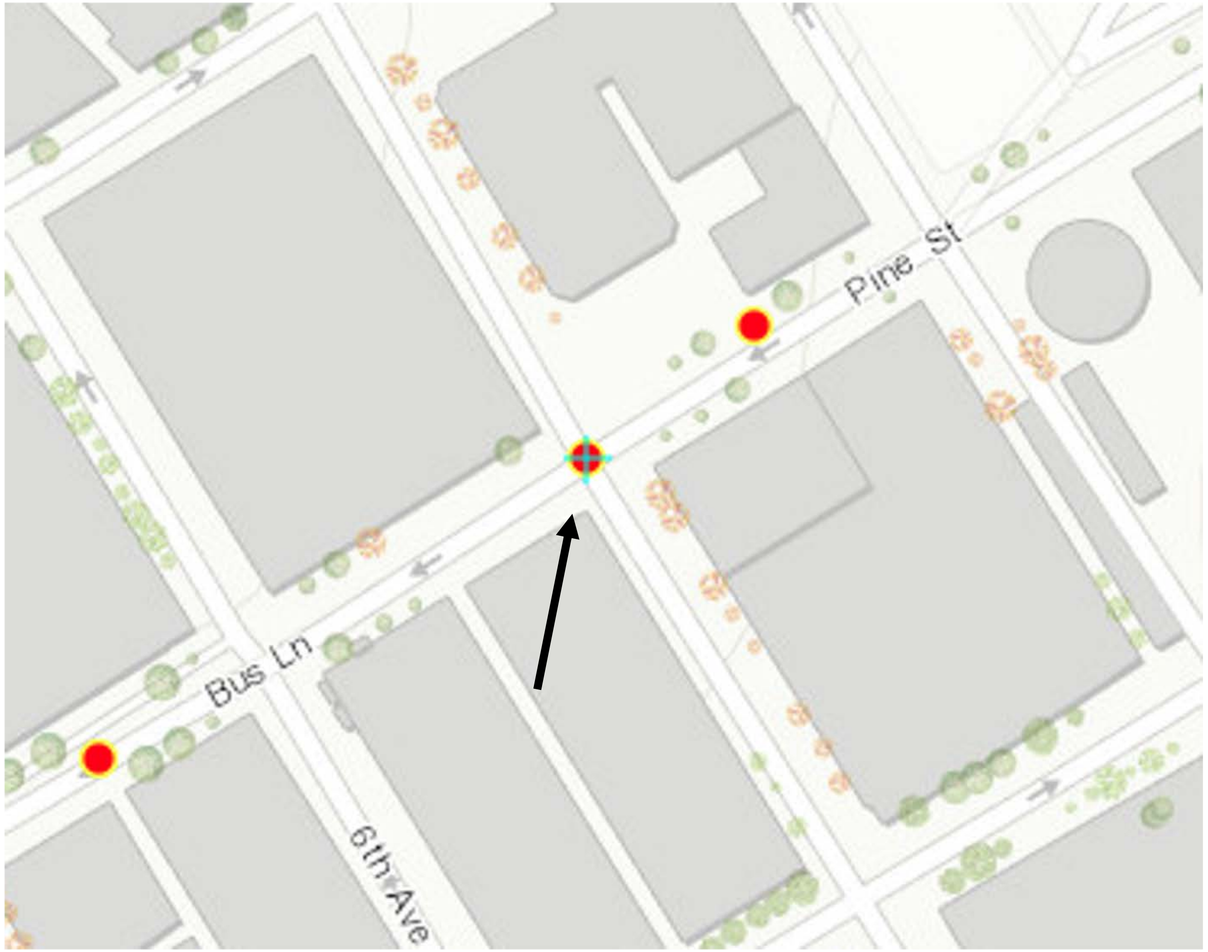
Data cleaning alley inventory - Extreme.Point.End (Features: 1, Selected: 1)

Input the alley's extreme point width	What type of extreme point is being surveyed?	What is the name of the street closest to the alley's access point?	What type of street is it?	Input the length from the curb to the alley's access point	Where is the access point located?	Inpu width
18.00	Intersection with another alleyway (inside the city block)	Stewart St.			North or East face of the city block	

Review of
<u>end extreme point</u>

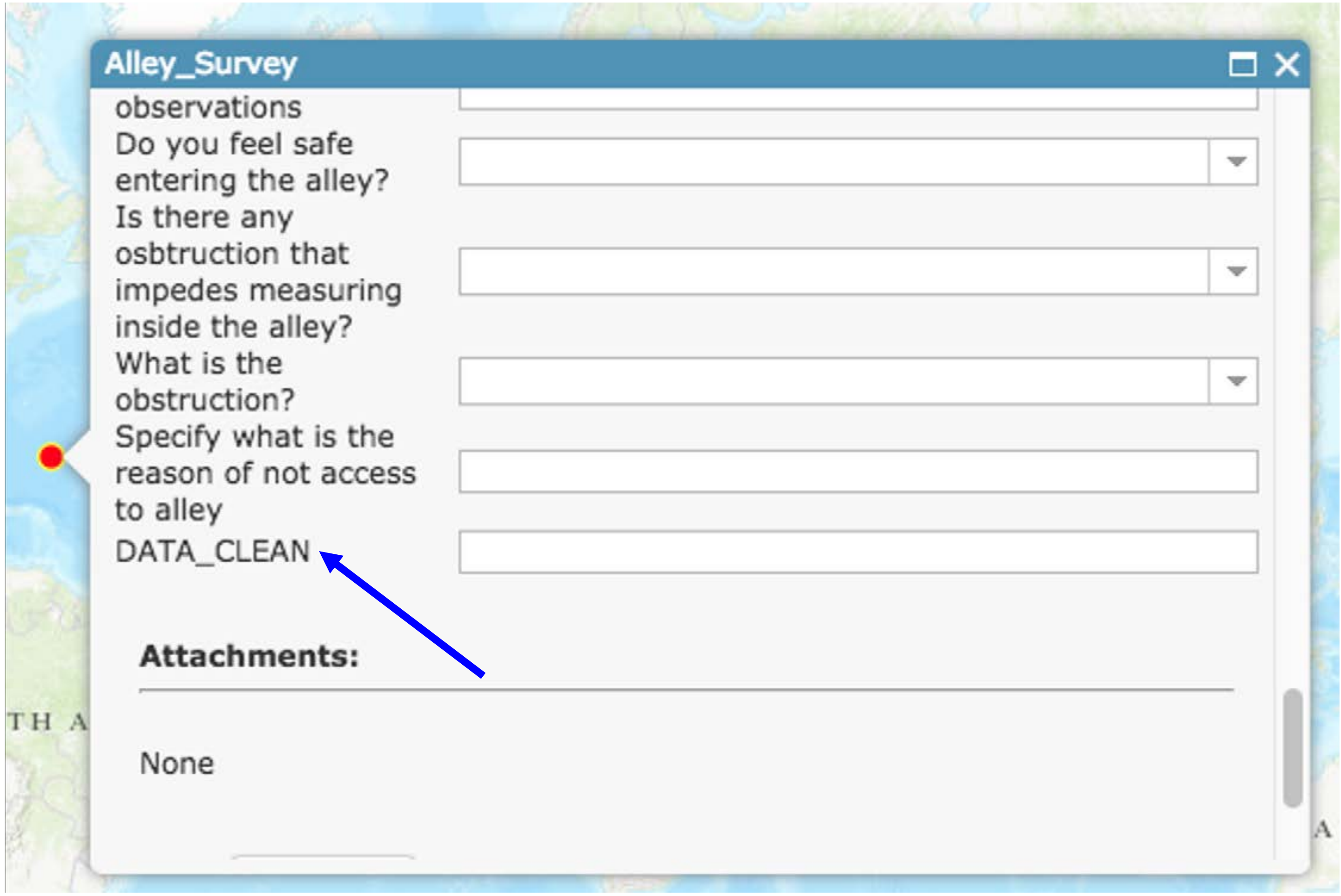
Turn on the point feature “Extreme.Point.End” through the Contents panel

- Is the geopoint off or does not match what you have on the hard copy map filled in field?



Report your edits of extreme points

Report your edits and issues that you can not correct by typing observations in the field **DATA_CLEAN** of the corresponding survey



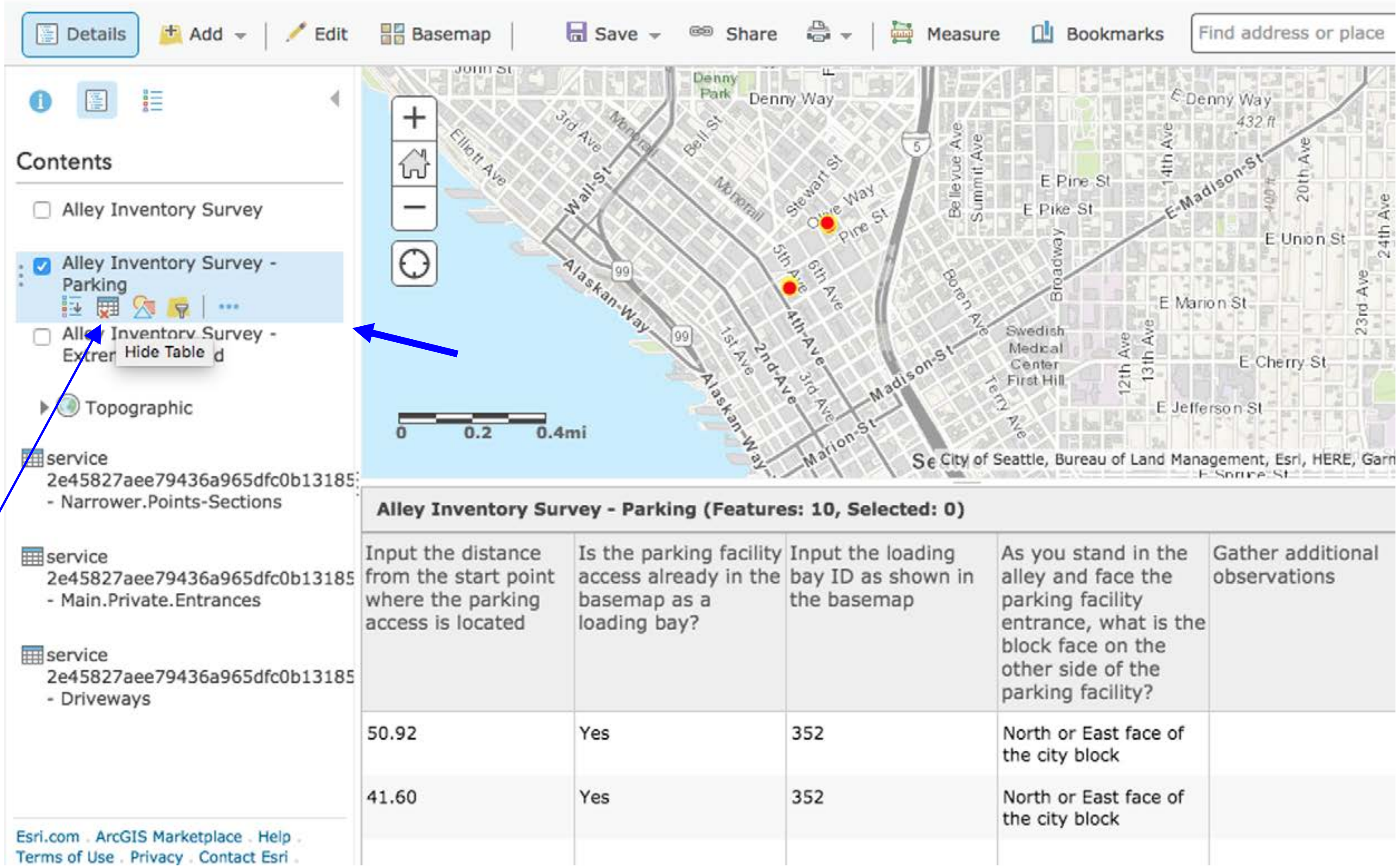
Review of freight parking

Compare old and new pictures of the infrastructure

Access alley´s parking table

Use the Contents panel to:

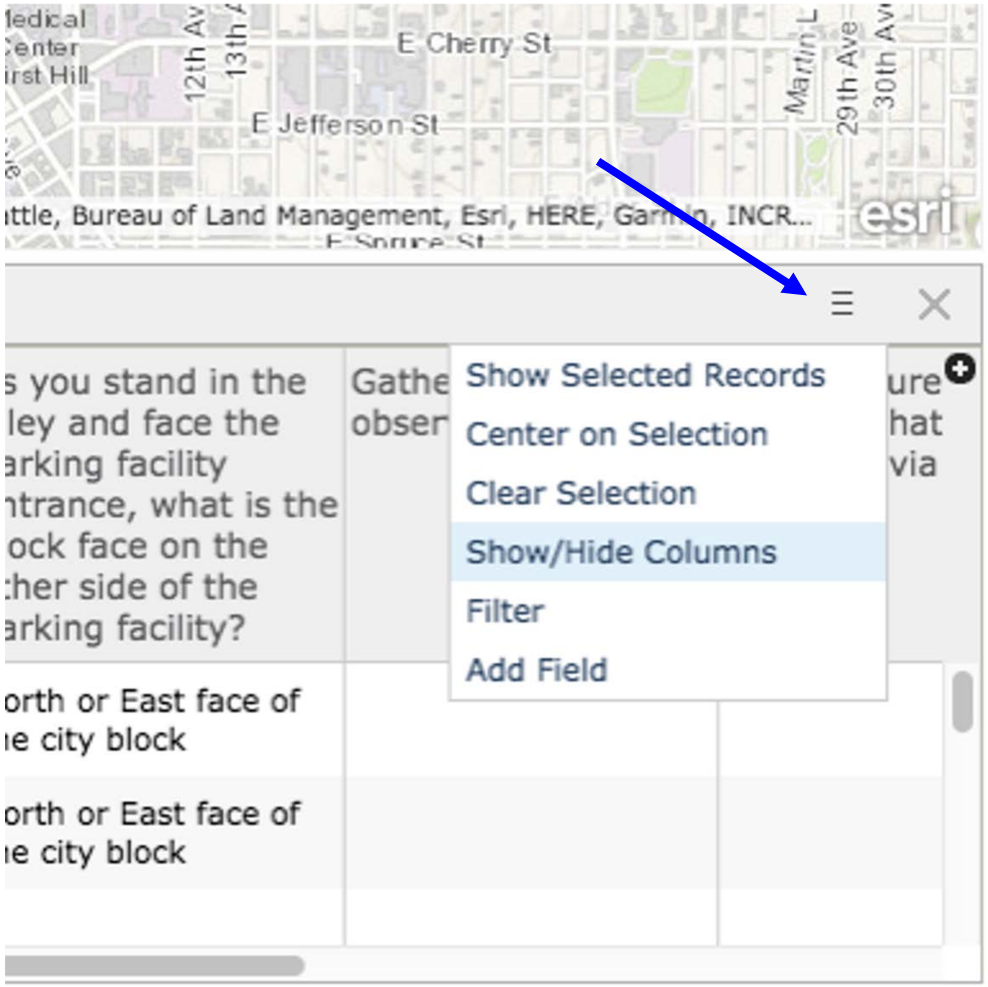
1. Turn on only the point feature Alley Inventory Survey - Parking
2. Show parking table by clicking on the table icon



Access alley´s parking table

Hide/show some columns of the parking table to only show the following columns:

- **Column:** *Is the parking facility access already in the basemap as a loading bay?*
- **Column:** *Input the loading bay ID as shown in the basemap*
- **Column:** *Gather additional observations*
- **Column:** *CreationDate*
- **Column:** *Creator*
- **Column:** *Photos and Files*



Access alley´s parking table

Hide/show some columns of the parking table
to only show the following columns:

Alley Inventory Survey - Parking (Features: 10, Selected: 0)

Is the parking facility access already in the basemap as a loading bay?	Input the loading bay ID as shown in the basemap	Gather additional observations	CreationDate	Creator	*Photos and Files*
			1/16/2018, 3:32 PM	[redacted]	(0) Add
Yes	352		1/16/2018, 3:32 PM	[redacted]	(1) Show
			1/16/2018, 3:32 PM	[redacted]	(0) Add
No			1/16/2018, 3:32 PM	[redacted]	(1) Show
Yes	352		1/16/2018, 3:32 PM	[redacted]	(1) Show
No			1/16/2018, 3:32 PM	[redacted]	(1) Show
Yes	341		1/16/2018, 3:32 PM	[redacted]	(1) Show

Review all loading bays at once:

Sort the table by the column “Creator”. Use the visible information from the parking table to review the pictures of parking facilities that:

- Show your UW user name in the Creator column
- Show the right date when you collected the data under Creation Date column
- Were identified in the basemap as loading bays

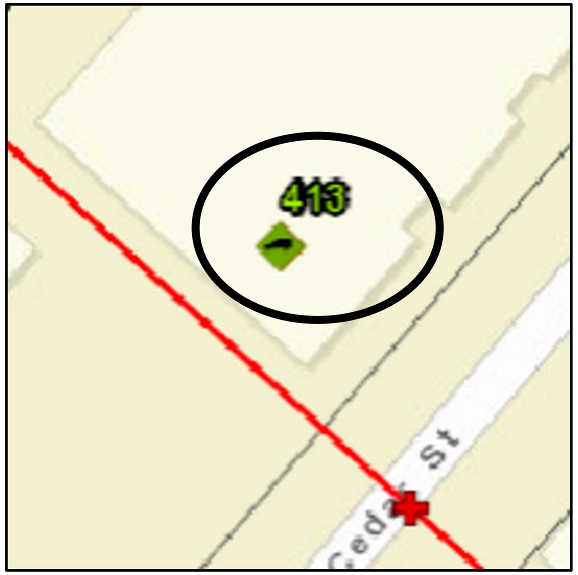
YOU NEED TO CHECK THE FOLLOWING:

1. Is the loading bay ID that you wrote on field correct?
2. Compare the pictures that you took of the parking facility with the pictures with the same ID from the old database, are they the same?

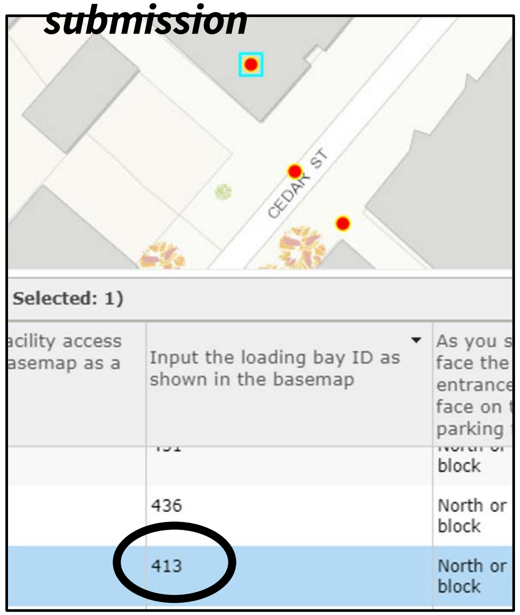
HOW TO FIND THE OLD PICTURE OF A LOADING BAY FOUND IN FIELD?

STEP 1: Look for the old picture ID using the Loading bay ID collected in field

Loading bay ID found in field



Loading bay ID in AOL after survey submission



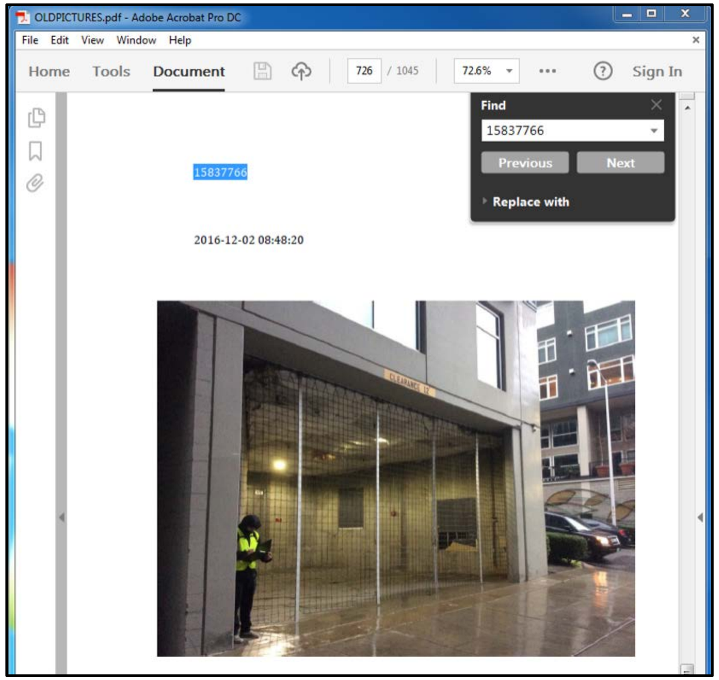
Old picture ID from OLDPICTURES.PDF

LOADING BAY ID FROM ALLEY SURVEY (SCTL)	OLD PICTURE ID FROM OLDPICTURES.PDF
400	15820969
401	15820970
402	15820977
403	15821020
404	15821042
405	15821058
406	15837757
407	15837758
408	15837759
409	15837760
410	15837761
411	15837762
412	15837763
413	15837766
414	15840402
415	15840403

HOW TO FIND THE OLD PICTURE OF A LOADING BAY FOUND IN FIELD?

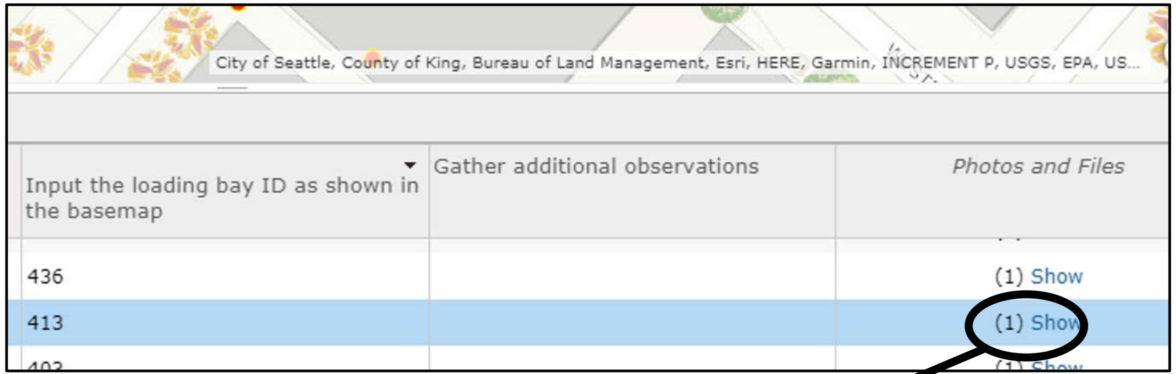
STEP 2: Compare the old picture and the picture that you collected in field, **are they they same?**

Old picture from OLDPICTURES.pdf



VS.

Loading bay picture from Alley Survey (SCTL)



Report issues with loading bays:

Type any issues that you may find about the reviewed loading bays under “Gather additional observations” column.

Alley Inventory Survey - Parking (Features: 10, Selected: 0)

Is the parking facility access already in the basemap as a loading bay?	Input the loading bay ID as shown in the basemap	Gather additional observations	CreationDate	Creator	*Photos and Files*
			1/16/2018, 3:32 PM	[redacted]	(0) Add
Yes	352		1/16/2018, 3:32 PM	[redacted]	(1) Show
			1/16/2018, 3:32 PM	[redacted]	(0) Add
No			1/16/2018, 3:32 PM	[redacted]	(1) Show
Yes	352		1/16/2018, 3:32 PM	[redacted]	(1) Show
No			1/16/2018, 3:32 PM	[redacted]	(1) Show
Yes	341		1/16/2018, 3:32 PM	[redacted]	(1) Show

REMEMBER! Submit data cleaning report

After every data cleaning appointment, submit the following information by posting a message in our team facebook group:

- Picture of your base map clearly showing the city blocks that you inspected
- Last Survey ID on your basemap
- Number of surveys that you did that day of data collection
- Team members names
- Your RA supervisor for that data collection appointment

Facebook group:
[SCTL WQ18 Data Collection] - Task Order 4 - Alley's Project

City of Seattle
Jenny A. Durkan, Mayor

Department of Transportation
Goran Sparrman, Interim Director

From: Seattle Department of Transportation
Transportation Operations Division
Seattle Municipal Tower 700 Fifth Avenue, Suite 3700
Seattle, WA 98104

January 18th, 2018

This letter is lists persons working with the University of Washington's Supply Chain Transportation and Logistics (SCTL) Center in cooperation with the Seattle Department of Transportation (SDOT).

The surveyors are:

[redacted]

They are performing research between January 18, 2018 and March 9th, 2018 to better understand goods delivery in highly developed urban settings in the 'Final 50 Feet'. This complex delivery step involves parking, building access, physical delivery, inventory sign-off and even payment, and all this must be performed in tight and crowded spaces and under demanding time constraints.

With your cooperation, UW and SDOT can use the information these students are gathering to improve delivery to buildings downtown and potentially traffic flow in Seattle. If you have questions or concerns, please feel free to contact either of us for more information.

Thank you,

Christopher Eaves P.E.
Senior Civil Engineer
Cell: [redacted]

Jude Willcher A.I.C.P.
Strategic Advisor
Office: [redacted]

Seattle Municipal Tower
700 5th Avenue, Ste 3800
PO Box 34996
Seattle WA 98124-4996

Tel (206) 684-ROAD / (206) 684-5000
Fax: (206) 684-5180
Hearing Impaired use the Washington Relay Service (7-1-1)
www.seattle.gov/transportation

SUPPLY CHAIN TRANSPORTATION & LOGISTICS CENTER

UNIVERSITY *of* WASHINGTON

Urban Freight Lab

SCTL CENTER

UNIVERSITY OF WASHINGTON

BOX 352700

SEATTLE, WA 98195

Phone: 206.221.6407

Email: sctl@uw.edu

Glossary

Alleys ^back

Cities' alley definitions may vary. Seattle "Streets Illustrated" manual definition reads: "Alley means a public right of way not designed for general travel and primarily used as a means of vehicular and pedestrian access to the rear of abutting properties. An alley may or may not be named."

End Points ^back

According to the alley typology the UFL team developed, every alley has two end points, which fit one of three types: access point, dead end or intersection.

Apron ^back

The alley apron is a driveway (an entranceway) that starts at the curb and continues until the start of the alley pavement. The apron edge uses a curb cut to provide vehicle access from the street. Alley width, length, and cross slope were recorded; slope can determine whether fully-loaded handcarts can maneuver.

World Street Basemap ^back

This worldwide street map presents highway-level data for the world. Street-level data includes the United States; much of Canada; Mexico; Europe; Japan; Australia and New Zealand; India; South America and Central America; Africa; and most of the Middle East.