# SAFER AND ACCESSIBLE SIDEWALKS IN PHOENIX

## City Launches CurbPHX Sidewalk Inventory to Improve Pedestrian Experience

**Disclaimer: For visioning purposes only, document may not reflect current state of project**

(Phoenix, AZ - September 30, 2021) Today, the City of Phoenix Department of Transportation launched CurbPHX, a comprehensive inventory of sidewalks and curb ramps throughout Phoenix. CurbPHX is the source for data on sidewalks in the city. CurbPHX helps city planners improve pedestrian mobility and safety citywide by increasing the understanding, prioritization and of the condition and usage of sidewalks and curb ramps to prioritize mobility projects.

Phoenix has the opportunity to expand the data sets used to understand the location and condition of sidewalks and curb ramps. Access to sidewalk data makes it possible to identify and prioritize funding for infrastructure investments. A sidewalk data layer supports the ability to measure the impact of projects on the City's sidewalk and ramp network. Residents and staff would also benefit from an ability to provide input on hazards identified on the sidewalks. A sidewalk layer will help identify areas of need and support the increased use of mobility resources.

Envisioning a master digital inventory for data on the Phoenix sidewalk network, the City assembled disparate datasets, increased data completeness and integrity and awareness and access to sidewalk network data. CurbPHX attributes will grow over time to include; 1. data schema allowing fiscal, conditional, location, and maintenance records to function as an asset/information management system; 2. utilize machine learning to process aerial imagery and identify both location and characteristics of sidewalks and curb ramps; 3. development plans, for as-built updates, and 4. inspector and resident inputs regarding needs/usability.

"A complete and well-maintained sidewalk network is an essential component of Phoenix's mobility infrastructure," said Deputy Mayor Julie Jones. "CurbPHX provides the foundation we need to know where our sidewalks are and get input to ensure they are safe and usable for all Phoenicians."

CurbPHX is a cloud-based software solution owned and operated by the Phoenix Street Transportation Department. CurbPHX data sets could include GIS layers, attribute data like width, curb height, construction data, surface condition, location of bus shelters and street furniture, permits for new construction and maintenance requests. Users access CurbPHX data through the portal with their city login. CurbPHX, includes a data analytics and visualization dashboard to identify information on the sidewalk network. Users can run reports to identify areas without sidewalks and sections reported in need of repair to help prioritize investments and improvement to the sidewalk portfolio. CurbPHX uses photo imagery and machine learning to create the sidewalk attributes. CurbPHX also allows city staff, construction teams and residents to submit pictures and or descriptions of repair requests, flooding and blockages.

"I moved into a new development about a year ago that I loved because it was close to a grocery store. I'm in a wheelchair so mobility is a big deal to me. What I didn't notice was some sidewalk was missing to get there," said Mal Craig of Phoenix. "I reported the issue using CurbPHX and quickly noticed Phoenix crews installing that missing sidewalk section. Now I can easily get to the store on my own."

For more information on the City of Phoenix Sidewalk Inventory please visit www.phoenix.gov/curbphx.

# FREQUENTLY ASKED QUESTIONS (FAQ)

1. What are we building and why?

   We are building a database of curb ramps and sidewalks for the City of Phoenix. We are also creating a process that updates the database as new sidewalks or curb ramps are added.

2. What does it do?

   The database provides staff and the public locations for all the sidewalks and curb ramps in the City of Phoenix. Additionally, the database format can be used in Geographic Information Systems (GIS) in order to create analyses and prioritize investments on where future sidewalks or curb ramps are needed or need to be repaired. All of this will help improve mobility in the City.

3. What is this replacing, combined with or creating new?

   a. The City of Phoenix does not have a complete digital database of where its sidewalks and curb ramps exist. This process would create a brand-new inventory for all the sidewalks and curb ramps in the City of Phoenix in a format that can be used in Geographic Information Systems (GIS) in order to conduct analyses and prioritize investments based on where sidewalks or curb ramps are needed.

   b. By contrast, the City does have GIS layers for other right-of-way assets, for example traffic signals or street lighting. The new inventory of sidewalks and curb ramps can be related in the future to other right-of-way layers such as traffic signals to help staff determine accessibility issues for pedestrians and improve pedestrian connectivity in critical areas.

4. What data sets does this require and where will they come from?

   a. The solution is based on 2 inch aerial pictometry from EagleView - the Maricopa County imagery vendor.

   b. Data schemas, not all developed yet, would be needed to ingest the output from the imagery analysis. They include:

      ● Curb ramp characteristics (exists, but needs minor modification)

      ● Sidewalk characteristics

      ● Sidewalk and curb ramp maintenance tables

      ● Sidewalk and curb ramp add/delete/change archives ● Sidewalk and curb ramp costing

      tables (for asset management)

5. What is the base data set for CurbPHX and how is it accessed?

   Maricopa County contracts with EagleView to provide the base aerial imagery. This will be the annual baseline dataset. Initially, this data will be used for complete City capture and in future years for comparative analysis.

6. How to interface with aerial imagery?

To extract information from the imagery, a program will recognize sidewalks and curb ramps from the image and recognize certain characteristics.

   a. The camera's X,Y location is known (ARAN van driving in street)

   b. The cameras take multiple front-view and rear-view images from each location

   c. The van travels a set distance (approximately 16')

   d. Triangulation across two or more images, locating the same feature, will determine their exact location relative to the van.

In areas where automatic extraction becomes problematic, staff or consultants can be engaged to extract the assets and all associated information from the imagery into the tables.

7.  What are the benefits and which services are included?

   a. Internal users can use the dashboard to run reports, including to identify areas without sidewalks, sections in need of repair to help prioritize investments and improvement to the sidewalk portfolio.

   b. Internal users can overlay this data with other useful information, for example, pedestrian crashes, to determine trends in pedestrian safety.

   c. Citizens, pending public sharing, would be able to better plan safe routes.

8.  What laws, regulations and procedures does this need to be compliant with?

While the City is not aware of any laws or regulations the tool needs to comply with, it is of great interest for the City to determine which areas need to be brought up to standard to comply with the Americans with Disabilities Act (ADA).

9.  Who will own, operate and maintain this solution?

Street Transportation Department, including GIS, Asset Management, and Street Maintenance groups.

10. What does this need to be interoperable with?

   a. Other GIS Data - spatial relationships might need to be created, linking sidewalks/curb ramps from this output to all City administrative areas such as districts, neighborhoods, streets, lighting, signalization, shade, schools, maintenance service areas, etc.

   b. Service Requests (internal) - Our CitizenServe application for work order processing would need to issue work based on (at minimum) street locations or address. Once the work is completed, the base data characteristics will be updated showing type of improvement and date work was completed.

      ● Customer/Citizen inputs - It is possible that we will allow citizens to recommend additions or maintenance once the network is shared.

11. What training does this require and how will it be developed and provided?

a. Training will be required for staff performing annual and ad-hoc updates.

b. Training in the form of 'help' type materials will be made available to system users.

c. Training can be in the form of online live workshops that can be recorded and reused.

12. How will we measure success? What are the key performance indicators?

a. The City will have a sidewalk and curb ramp inventory.

b. The City will establish a system to review, update, analyze and report - by using EagleView aerial imagery data, GIS tools, and other databases.

c. The City will be able to track location and number of new sidewalk miles and curb ramps added from year to year.

d. Following outputs can be some of the key performance indicators of a successful inventory.

- The City will be able to understand gaps/needs and create projects.

- Number of projects generated from CurbPHX.

- Number of resident or inspector input/complaints.

13. What is the worst thing that could happen from implementing CurbPHX?

a. The tool could be developed to provide information on locations of existing curb ramps and sidewalks, but the data set could become obsolete if it is not updated on a regular basis.

b. The imagery may be incomplete or obstructed in some areas.

14. What are the required data attributes?

a. Spatial location (polygonal GIS data)

b. Condition, Date Inspected, Date constructed (when known), Width, Distance from street, Material (concrete, brick pavers, colored), Connected to Curb Ramp (Y/N), Connected to defined Crosswalk (Y/N) (Note: this data does not exist today).

c. Related table for Curb Ramps (already exists)

d. Related table for Crosswalks (does not exist): Signalized (Y/N), Last painted/marked date

e. Related table for maintenance activities: date, submitted by, work performed (domain values)

f. Related table for costing and contracting

15. Who can submit sidewalk data and how?

a. Citizens – through an online submission tool, for further validation and inclusion.

b. Inspectors, and other appropriate Street Transportation staff – through an online editing tool.

    c.   Planning and Development Department (possibly) – for private development updates.

16. How to reconcile data year over year?

    a.   Recurring GIS integration review

- A data schema containing 'image capture date', and spatial location, can be compared for new locations.

- A data schema containing 'condition characteristics or rating', as standardized domain values, along with spatial location, can be compared for change analysis/review/approval.

    b.   Verification with Aerial and/or Street view imagery and/or field inspections, is a secondary method for driven locations with problematic collection.

    c.   Extraction could be validated every two-three years rather than every year

17. How will CurbPHX help the city comply with the Americans with Disabilities Act ADA?

This process will assess curb ramp ADA characteristics that can be identified through imagery alone and would help inform existing database. The following two characteristics will be identified:

- Surface types (Standard/Stamped/Brick)

- Truncated Domes (Yes/No)

Having this information in the curb ramp inventory would help identify newer versus older curb ramps and indicate potential compliance issues.

18. How will the inventory be kept up?

    a.   Recurring imagery review

    b.   CIP (Capital improvement projects) project as-builts

    c.   PCCR (Portland cement concrete repair) projects

    d.   Developer as-builts (Planning and Development Department)

19. What City staffing resources are needed to build, maintain and operate?

    a.   Assuming an automated machine learning program/tool can identify, and wholly or partially categorize, date and inventory sidewalks, curb ramps, and characteristics. And, assuming this will be built into a polygonal, linear, or point based GIS data as unique features with database field attribution. Staff would be needed to do the following:

- Reconcile incoming data with existing data (see #17)

   b. After the database is validated and updated with each new build. Staff may be asked to:

- Build GIS applications for viewing, editing, and distributing the GIS data at planning, maintenance, and possibly public information portals and dashboards.

- Build IT applications for submitting, processing, and closing work requests related to maintenance needs. This can be incorporated into or interfaced with Citizen Serve.

- Develop planning/costing tools for the programmatic fiscal need management of this asset.