

ADA Compliance

Is Your City ADA Compliant?

Are you able to make good decisions based on the information you currently have about your city?



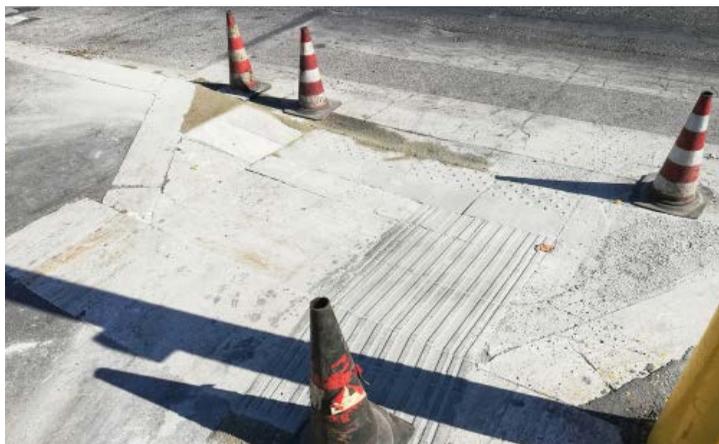
EXECUTIVE SUMMARY

The Americans with Disabilities Act (ADA) has a set of guidelines to ensure that facilities, streets, sidewalks, and curb ramps are accessible to everyone. If sidewalks and public walkways are not accessible, they are one of the most common areas that can pose great challenges and dangers to individuals with disabilities, or to anyone using a mobility device.

Considerations for ADA compliance of a public walkway includes factors such as: sidewalk width, sidewalk surface hazards, sidewalk slope, and curb ramps. To adhere to ADA compliance, all new facilities and public right-of-ways are built according to the 2010 guidelines set forth by the ADA.



For existing features, cities need a plan to inventory areas where additional ADA improvements are required and a transition plan for addressing the areas. With our experience working on ADA compliance with cities in Arizona and California, BPG and our partners are well-suited to inspect existing sidewalks and intersections to identify areas not within ADA compliance.



BPG and our partners take the following steps to help cities develop transition plans for making existing infrastructure ADA compliant:

Assess the extent to which your city meets ADA requirements.

Using either LiDAR, ground survey, or a combination of both, BPG inventories specific traffic corridors or whole cities to identify areas where curb ramps are needed. During the process we are able to measure additional information such as width of sidewalks, slopes of sidewalks and intersections, and number of and location of traffic signals.

Prioritize locations that need have issues.

ADA ramps are needed at all locations constructed or altered after the 2010 ADA requirements. Constructing a whole city of curbs at once is not feasible. This is an opportunity for cities to define areas of importance. BPG partners with municipalities to assign priorities based on local values. This can change the severity of issues based on proximity to local government facilities, bus stops and other transportation services, public accommodations, business districts, and residential areas.

Provide a long-range plan to provide curb ramps in locations that need them.

BPG and our partners assist in developing a plan to identify and prioritize areas for ADA enhancement. With the comprehensive data collected, decision makers are presented with clear, concise information that allows them to quickly determine the areas with the most need. This methodology creates a transition plan that is effective, fair, and transparent.

BPG provides the report as information side by side with the relevant standards. This report allows decision makers to quickly discern which attributes are not within standards, while also giving the reader a more thorough understanding of how severe any failure is. BPG and our partners can incorporate additional factors that can affect the severity of issues. Some of these additional factors can include proximity to schools, government buildings, parks, bus stops, and much more. The algorithm used to determine the overall severity of issues can be customized to fit the individuality of community's priorities.

The knowledge gained from this report allows leaders to make informed decisions quickly and accurately. Time, money, and resources can be directed to where they will provide the greatest benefit to the community.

TECHNICAL ASPECTS

BPG uses the Topcon IP-S3 mobile LiDAR system as its primary tool for collecting data for ADA Compliance projects. This system produces 700,000 pulses per second. At the speeds and ranges we scan at for ADA projects, we achieve approximately 200-500 points/ft² for sidewalk panels. Due to our standard practice of overlapping intersections, ramps at intersections can have up to 1000 points/ft². Not only do these points provide the ability to accurately measure features within the point cloud but it produces an image-like point cloud.

Another benefit of the technology and software used by BPG is that our analysts can compare the LiDAR cloud side-by-side with panoramic images taken during collection. This allows our analysts to work in the best environment for their task.

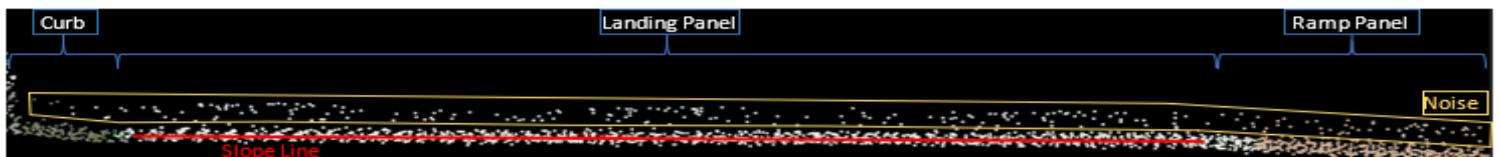


Colorized Point cloud from IP-S3



Side by side view of point cloud and images

With the density of the LiDAR points we achieve, slopes are accurately calculated along the entire length of the panel. The added benefit of our dense point cloud is that we can mathematically determine which points in our cloud are “noise” and disregard those in our measurements.



Representation of data used to calculate slope lines for a landing panel.

To ensure a consistent application of the process to remove noise, the appropriate points for the slope calculations are calculated using a multiple regression model. This model uses three factors: the segment length, a width around the slope line, and an offset of the slope line. The output is then reviewed by BPG personnel. Any slope that measures greater than 4% or has a Root Mean Square Error greater than 10 are manually cross-referenced for verification. After this step is completed, not only are the slopes verified, but the client has access to show that the results are based on sound mathematics. By partnering with BPG and our partners, clients benefit from having a documented, data driven procedure as well as the speed and reliability of a proven, repeatable process.

REPORTING

With the comprehensive data collected, BPG and our partners can tailor reports to fit the specific needs of our clients. While data is crucial to the process, it is not what decisions are based on. BPG and our partners provide the report as information side by side with the relevant standards. This report allows decision makers to quickly discern which attributes are not within standards, while also giving the reader a more thorough understanding of how severe any failure is. BPG goes beyond the data collected by our LiDAR systems. With the help of our partners, we can incorporate additional factors that can affect the severity of issues. Some of these additional factors can include proximity to schools, government buildings, parks, bus stops, and much more. The algorithm used to determine the overall severity of issues can be customized to fit the individuality of community's priorities. An example report is shown below.



Ramp and Sidewalk features with running slope and cross slope lines.

This reporting is one of the greatest benefits of partnering with BPG. The knowledge gained from this reporting allows leaders to make informed decisions quickly and accurately. Time, money, and resources can be directed to where they will provide the greatest benefit to the community based on a fair and transparent process.



Example Compliance Report Public Rights-of-Way (Curb Ramps)

Intersection ID: 104	Main Street: Main St	Cross Street: E 2nd St	Location: SW
ADA ID: 5000	Ramp Type: Perpendicular	Overall Compliance: No	Severity Score: 41.25
Existing Access Barrier and Possible Solution	Codes/Mitigation Info	Field Measurements/Component Compliance	



Street 1 Name **Main St**
 Stop Condition - Street 1 **Signal**
 Street 2 Name **E 2nd St**
 Stop Condition - Street 2 **Signal**

Possible Solutions: **Remove and replace with Mag No. 236-4**

Surveyor Notes: **No Landing**

PROW/ADA: **R304.2.1, R208, R304.5.1**

Total Cost: **\$ 2200**



Compliance	Description	Data	Standard	Compliance	Description	Data	Standard
N/A	Ramp Length LT (in)	N/A		N/A	Ramp Length RT (in)	N/A	
N/A	Ramp Width LT (in)	N/A	>=48	N/A	Ramp Width RT (in)	N/A	>=48
N/A	Ramp Slope LT (%)	N/A	<=8.3	N/A	Ramp Slope RT (%)	N/A	<=8.3
N/A	Ramp X Slope LT (%)	N/A	<=2.0	N/A	Ramp X Slope RT (%)	N/A	<=2.0
N/A	Ramp Length (in)	54.9					
No	Ramp Width (in)	47.6	>=48		Grade Break?	No	
Yes	Ramp Slope (%)	5.5	<=8.3	N/A	Grade Break Slope %	N/A	
Yes	Ramp X Slope (%)	1.3	<=2.0	N/A	Grade Break Slope X %	N/A	
	Flare Type LT				Flare Type RT		
Yes	Flare Slope LT (%)	5.5	<=10.0	Yes	Flare Slope RT (%)	2.3	<=10.0
Yes	Flare Traversable LT?	Yes	Yes	Yes	Flare Traversable RT?	Yes	Yes
N/A	Landing Length (in)	N/A	>=48	No	Domes Provided?	No	Yes
N/A	Landing Width (in)	N/A	>=48	N/A	Domes Contrast?	N/A	Yes
N/A	Landing Slope (%)	N/A	<=2.0	N/A	Domes Length (in)	N/A	>=24
N/A	Landing X Slope (%)	N/A	<=2.0	N/A	Domes Full Width?	N/A	Yes
N/A	Landing Curb? (Y/N)	Yes		N/A	Domes Offset (in)	N/A	1.6-2.4
N/A	Shared Landing?	No					
Yes	Gutter Ponding?	No	No	Yes	Counter Slope (%)	0.7	<=5.0
Yes	Gutter Lip Ht (in)	0	0	Yes	Counter X Slope (%)	0.6	<=2.0
N/A	Painted X Walk 1?	Yes		N/A	Painted X Walk 2?	Yes	
	X Walk 1 Direction	N			X Walk 2 Direction	E	
Yes	X Walk 1 Width (in)	120	>=72	Yes	X Walk 2 Width (in)	N/A	>=72
Yes	X Walk 1 Slope (%)	1	<=5.0	No	X Walk 2 Slope (%)	6.3	<=5.0
Yes	X Walk 1 X Slope (%)	0.4	<=5.0	Yes	X Walk 2 X Slope (%)	0.5	<=5.0
Yes	Ramp inside XWalk 1?	Yes	Yes	Yes	Ramp inside XWalk 2?	Yes	Yes
	Road Slope (%)	0.4		Yes	Clear Space?	Yes	Yes
	Road X Slope (%)	1		Yes	Clear Space to XWalk (in)	60	
No	Obstruction?	Yes	No	Yes	Storm Grate/Utility Hazard?	No	No
	Obs. Type	SRP Well		N/A	Storm Grate/Utility Type		
Yes	Surface Condition? (G/P)	Good	Good				



MEET BPG AND THE TEAM

BPG offers a spatial GIS-centric, comprehensive yet scalable solution to survey, map and track assets and infrastructure by using a combination of general surveying, mobile LiDAR, static scanners, and UAS's to perform asset management data collection tasks. This includes everything from striping on roadways to above ground utilities, tree inventories, signs, poles, pole connections, streetlights, traffic cabinets, buildings and facility footprints (interior and exterior). Let us assist you in building your Smart City.

We have many years of experience with assisting cities in planning their Americans with Disabilities Act (ADA) compliance such as sidewalk slopes. Feel free to contact BPG at info@BPGdesigns.com or contact one of our experts directly with any questions you might have.

ABOUT THE AUTHORS

Brandon Sisco - Project Manager

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Brandon Sisco currently works in Tempe, AZ where he manages a team of geospatial professionals for a design-build telecommunications and utilities company. Brandon earned his Bachelor's degree from the United States Naval Academy in Control Systems Engineering.

He has also earned Master's degrees in Aeronautics from Embry-Riddle Aeronautical University as well as in Geographical Information Systems from Arizona State University. Brandon has over 1000 flight hours in various military aircraft and Unmanned Aircraft Systems and over 15 years of experience with remote sensing.

Jesse Haagenon- GIS Developer / Analyst

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Jesse has always had a love of science and working with technology. He grew up in Denver and went to MSU Denver where he obtained undergraduate degrees and certifications in Geology and GIS respectively.

He has worked with GIS technologies for over 15 years across multiple projects and platforms and has worked specifically with LiDAR and Mobile Mapping technologies in the past as well as well BPG. Jesse recently obtained his Masters in Geographical Information Systems from Arizona State University.



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