



Q&A

ALL ROADS LEAD TO DIMENSIONS



Q1: Trace the laser line from the device in E,2 - who's been distracted by the red dot? And how many other devices like this one can you spot in the scene?



A1: The curious kittens have been side-tracked by the laser light, which is coming from a Trimble laser scanner. This nifty piece of tech is super-popular with surveyors, as it allows them to scan a location and gather data that they can use to make 3D computer models - which are great for planning, construction, building maintenance and study (you can see an example of a 'point cloud' image in I,3). You might have

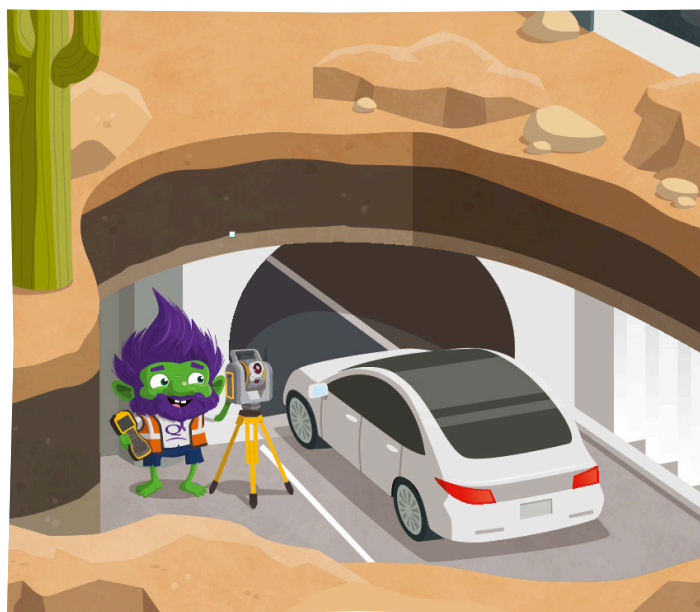
noticed that the scanning devices are mounted on tripods. That's because they are very sensitive to movement, and the terrain they are used on is often uneven. The legs of the tripods can be adjusted so that the scanning station can be positioned and secured exactly where the surveyor needs it! In total, there are four total stations in this scene! Did you spot them all?

Q2: You may have ridden an underground train or subway before, but have you ever been on an underground car ride? Who might have made the tunnel for cars in E,1, and why?

A2: This tunnel is called the LVCC Loop, which stands for the Las Vegas Convention Center Loop. It is an underground transport system featuring 1.7 miles of tunnels - filled with Tesla's electric cars that transport convention center visitors between three stations. It was built by The Boring Company (boring as in 'to dig', rather than something so uninteresting it might put you to sleep!), and opened in 2021, having cost approximately \$47 million.

So far, the LVCC Loop has transported more than 1.15 million passengers! And you can be sure that there were squads of surveyors involved in the planning and construction of these tunnels - perhaps like the one you can see in D,1 who is using ground-penetrating radar to scan and

'see' below the surface of the road without having to dig it all up!



Q3: Get a look at the rapid racer in G,2 before they blast past! They're testing out the new F1 Las Vegas Grand Prix street circuit. How might surveyors help to keep the new track in tip top condition?



A3: The first race of the Las Vegas Grand Prix is scheduled for November 18, 2023 as part of the Formula One World Championship, but this won't be the first time F1 cars have raced in Vegas! In 1981 and 1982, Formula One racers drove a circuit that was built entirely in the parking lot of the famous Caesars Palace casino! This time, though, the track is bigger, better, and will be raced at night for extra drama!

Amongst the many contributions that surveyors will have made to this epic race, the maintenance of the road surfaces will be of massive importance.

Parts of the track will be used by members of the public whenever there isn't a race on - including the famous Las Vegas Strip - so the road has got to be carefully maintained. It wouldn't be good if an F1 car popped a tyre because of a pothole or a damaged manhole cover! Survey teams will use their equipment to scan the road surface for damage, and they can then work with construction and maintenance teams to ensure the race can take place safely - and the drivers can push their cars to the limit on the track without worrying about damage from the road!

Q4: There's a pair of surveyors in C,2 using mixed reality lenses to 'see' below ground. What do you think they're taking a look at, and why?

A3: These surveyors are checking out the utility pipes that run underneath the surface of the Las Vegas streets. These transport water, gas, communication lines, and most importantly for the famed Las Vegas strip and its thousands of bright lights, electricity!

Surveyors can combine scan data with augmented and virtual reality technology to 'see' elements that either aren't there yet (such as a planned building or structure), or things that are buried or concealed - allowing them to work on their projects without causing disruption or delays by digging up the road!





Q5: From the Hoover Dam to the Barkin Basin, all waterways need to be looked after. What do you think the hydrographers in A,2 might be looking for?

A5: Hydrographers are surveyors who work in, around and underwater! They are using scanning equipment - including sonar scanners that work just like a dolphin's echolocation does - to collect geospatial information about the waterway. This might include things like the shape of a river or sea bed, which could then be used to make a bathymetric chart - a type of map that shows the submerged topography and physical features of sea bottoms - useful when you don't want to run your boat into shallow waters, or hit some hidden rocks!

The hydrographers could also be monitoring the boundaries of the waterway, collecting measurements that could be compared to previous scans so that erosion or any other potentially hazardous changes could be identified.

Q6: The survey drones are on 'Tourist Mode' in this scene - there are so many famous landmarks to see! How many can you name? And do you know where in the world the originals are?

A6: Just some of the landmarks on display in the scene are the Eiffel Tower (Paris, France), the Statue of Liberty (New York, USA), the Seattle Space Needle (Washington, USA) and the Walt Disney Concert Hall (California, USA). Surveyors love to use drones to scan and photograph buildings like this, as they are a quick and safe way to take a good look at structures that might otherwise be difficult or dangerous to access.

For bonus points, can you find out the height, cost, and date of completion for the buildings and monuments you have found? And remember, none of these buildings would exist without the hard work of talented geosurveyors!

