

ORT Front and Rear Triggers from a Single Gantry using Idris[®] Loops

There are substantial cost advantages in using a single gantry for ORT plaza sites, and Idris can straightforwardly manage the tracking of vehicles from the tag read zone through to the trigger point for all current VES systems. The maximum array length for a 4 loop Idris system is 54ft, which more than accommodates all current VES focal lengths. When both front and rear triggers are required, the situation can get more difficult. This paper discusses some ways of accommodating the required tracking zone using Idris capabilities.

The Problem

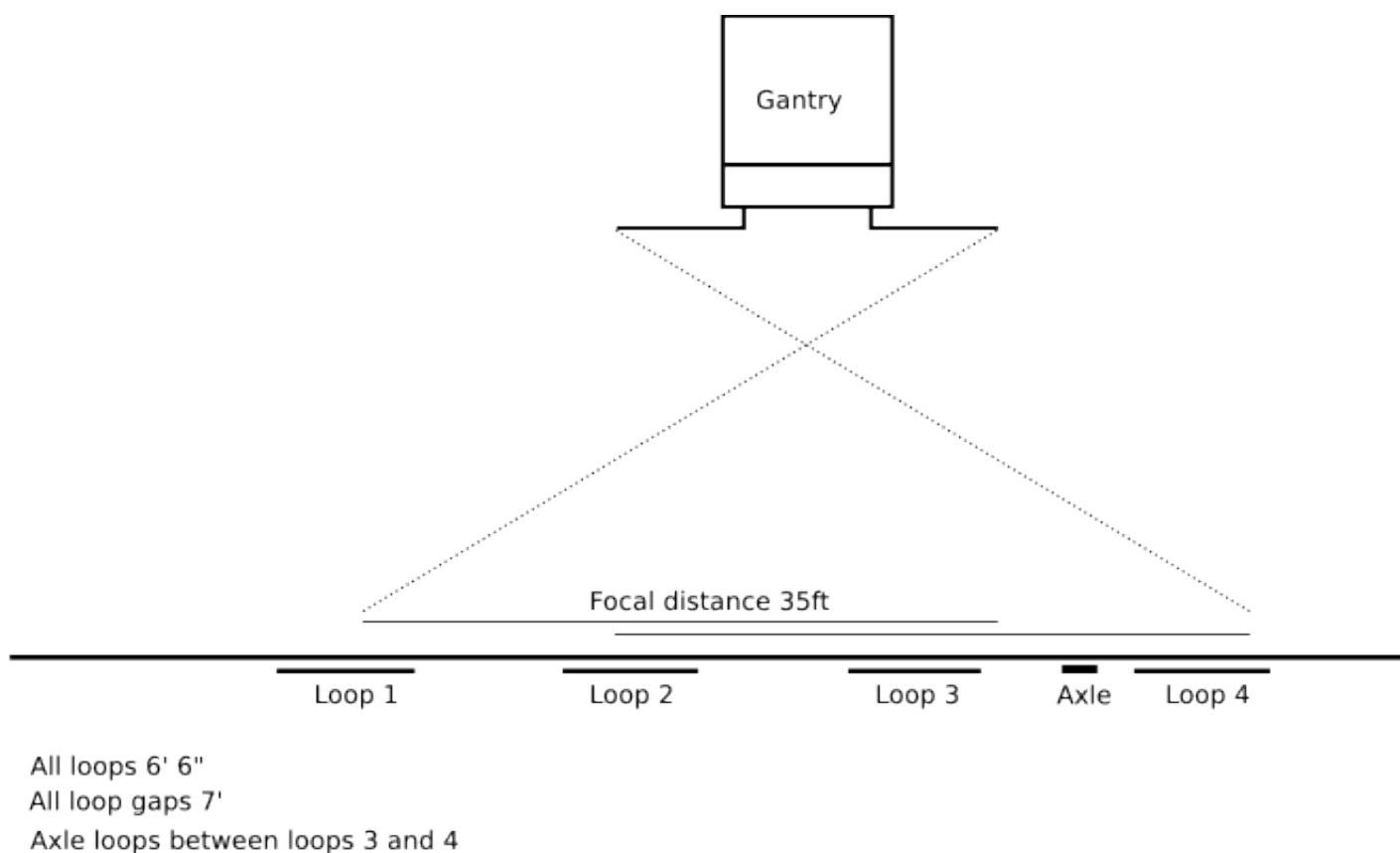


Figure 1 – 4 loop solution

Figure 1 shows potential positioning of front and rear triggers with 35ft focal length cameras for both front and rear cameras with an 8ft wide gantry with 5ft camera extensions. The rear trigger point is in an appropriate location, at the end of the rear loop. The front camera is focused on the centre of the entry loop, and cannot be brought to the second loop within the constraints of the camera and Idris 4 loop maximum dimensions. Unfortunately, triggering on the entry loop is far from ideal, because:

1. Triggering on the entry loop is subject to greater positional variation than triggering on the exit loop. The variation may be 5ft in total for vehicles other than motorcycles.
2. With a trigger level set to a reasonable level for most vehicles, some or all motorcycles will be missed.
3. When the vehicle is on the entry loop, there is no straddling information available, so many

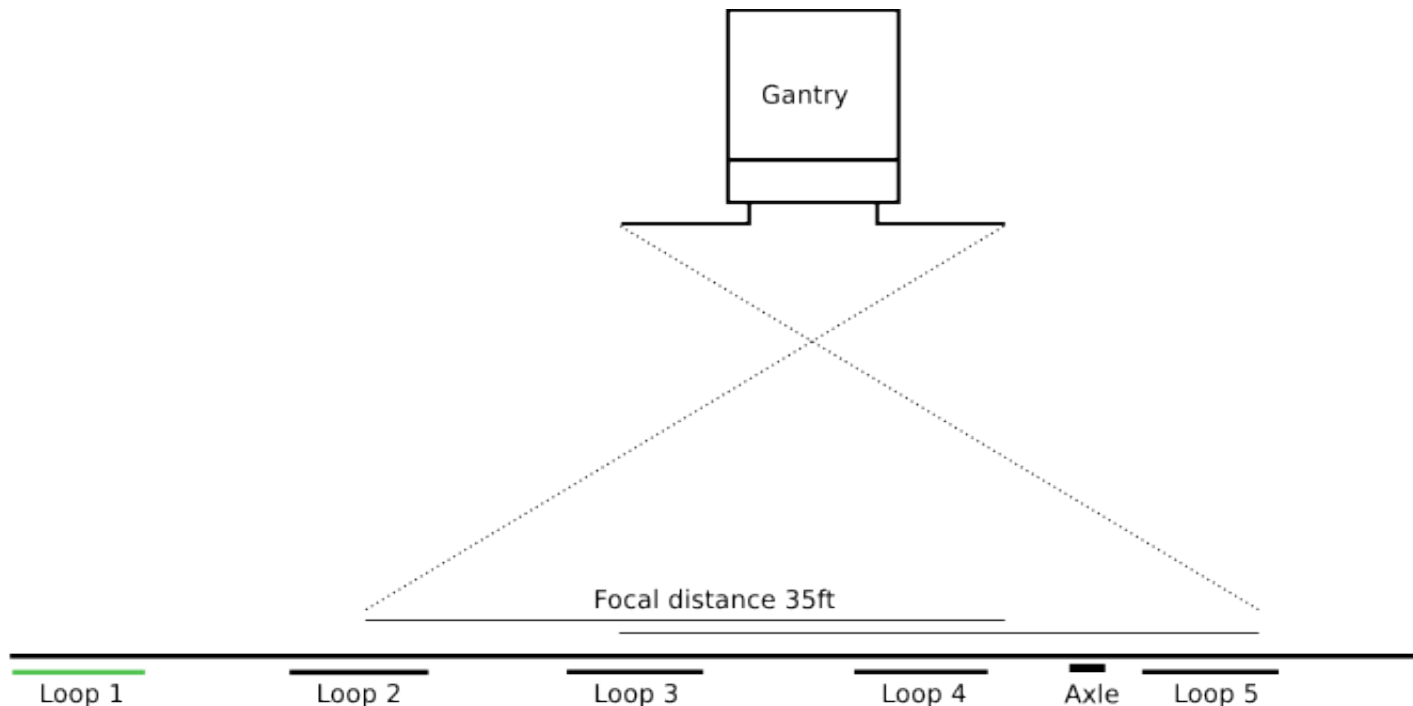
more pictures will need to be taken in some circumstances, and associating images and vehicles can be tricky. Straddling information is available when triggering on the second loop.

These considerations do not prevent use of the entry loop for triggering, as some cameras take multiple shots so the position variation is manageable, motorcycle front shots may be considered unnecessary, and the disposition of pictures to vehicles may be considered solvable. An important consideration is choice of camera for this purpose: a camera that takes a single shot is probably less desirable than one taking a sequence, the amount of image data notwithstanding. Indeed, the results from a single shot camera may be disappointing.

Possible Solutions

1. Use a multi shot camera and manage image association and trigger on the entry loop. Accept unreliable/absent motorcycle front shots.
2. Accept limited vehicle types for effective (OCR) front shot; for example trucks.
3. Extend the gantry supports so that a 4 loop Idris array enables a second loop trigger position. Depending on the exact camera and VES limitations, 7-8ft extension should allow use of a 4 loop Idris array.
4. Use the Idris Extended Array option, which allows extension of the Idris array to 5 or 6 loops.

The Idris Extended Array allows use of additional detectors to extend the array to a maximum length of 76ft, allowing for much greater flexibility in camera location, declination angle, and focal length. The requirement is for an extra detector for every two lanes covered, and per lane Idris licenses. An uneven number of lanes $\langle n \rangle$ requires $(n + 1) / 2$ detectors, and $\langle n \rangle$ extension licences. Figure 2 shows a representative design of a 5 loop Idris Extended Array. With a 5 loop array the split of main loops would be 2 on one detector and 3 on the other. For 6 loops the split is 2 and 4.



All loops 6' 6"

Gaps 6' 6" loop 1 - 2 & 2 - 3

Gaps 7' loop 3 - 4 & 4 - 5

Axle loops between loops 4 and 5

Conclusion

Idris provides for use of a single gantry for mounting of tag reader and both front and rear shot VES cameras, with substantial saving in civil engineering costs in comparison to multi gantry site designs. Idris provides a number of ways to achieve these savings, and the solution chosen will depend on customer requirements and site constraints.

Providing the main reason for the front camera is to capture license plates for trucks then an Idris 4 loop array can be made to work. If all vehicles are required to be captured with a reasonable OCR rate then the optimum solution would be to use 5 main loops.

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Idris is protected by one or more of the following patents:

EP0879457, USA 6345228 , 6337640 & 937741.

Patent Applications Pending in other Countries.

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