

Narrative Statement:
Description of Program of Experimentation

US VISIT Test Plan

Introduction

The RFID feasibility evaluation tests are to quantify the ability to read RFID tags in vehicles as they pass through a detection region that simulates exiting a US border port of entry (POE). A two-lane test track at the Raytheon Falls Church, VA facility is used for this purpose. A platform to simulate a sign bridge and other support structures is provided to support RFID readers and antennas. In addition, two test lanes of a suitable length for vehicles to safely travel at speed up to 40 MPH are part of this test facility.

Equipment for reading RFID tags is provided by each of two vendors for testing. The reader systems are to be interfaced with computers that automatically collect data from the tests. Test vehicles of different types and carrying varying numbers of passengers (with tags) are to be driven down the test track at different speeds during the evaluation of the performance of each vendor's system. The following sections describe the procedures to be followed in collecting the test data.

Test Facility and Equipment

Primary testing is to be performed in the test evaluation facility described below.

Test Facility Description

The RFID test lanes are sited at the northern most edge of the parking lot behind the Raytheon facility at 7700 Arlington Blvd, Falls Church, VA. The test track is approximately 1000 feet from end to end and runs in an approximately East-West direction. The track has two lanes to accommodate two vehicles driving side by side for the length of the track

The tag detection area, in which the readers are operating, depicted in Figure 1, begins approximately 500 feet from the start of the track and is approximately 100 feet in length.



Figure 1 Test Lane Tag Detection Area - Plan

A steel construction platform to simulate a highway sign bridge is located at the midpoint of the test track. Figure 2 depicts the sign bridge elevation view. The sign bridge supports antenna and reader equipment that will be oriented to look down on vehicles as they pass underneath the bridge. The platform has approximately 19 feet of ground clearance over the test track.

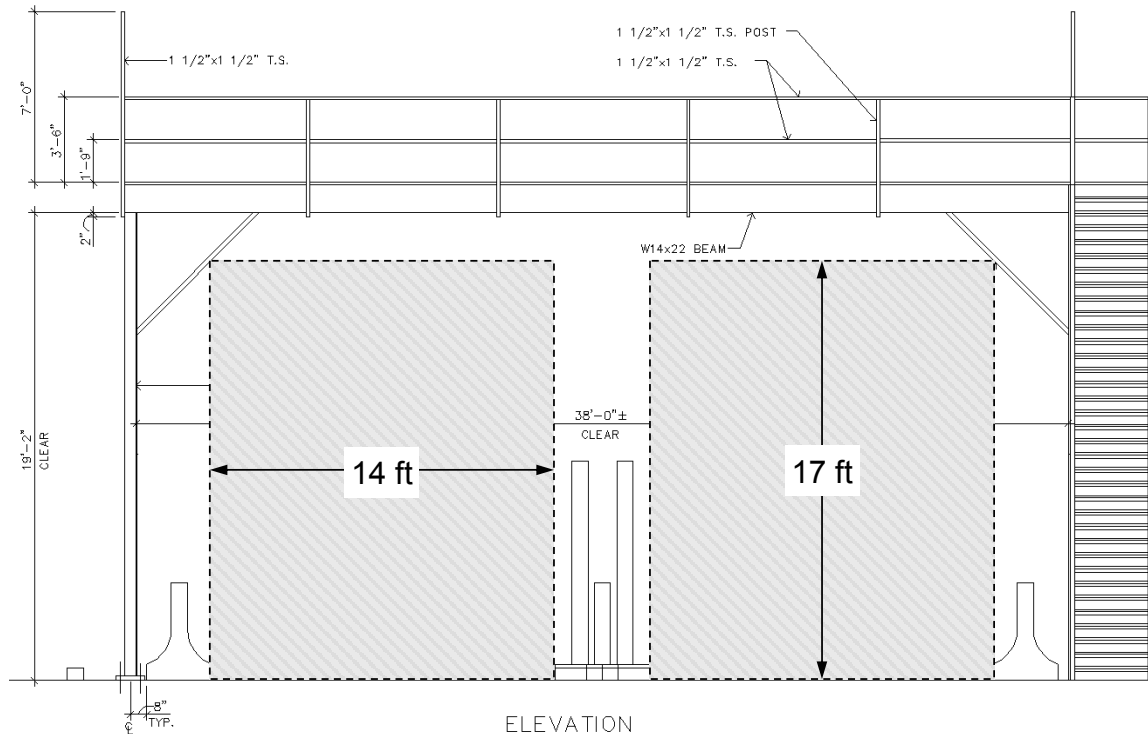


Figure 2 Detail of Overhead Structure - Elevation

Two steel light poles are fixed approximately 50 feet from the centerline of the overhead platform, one on each outside edge of the test lanes. Two additional steel poles are located in the median area approximately 16 feet beyond the first two poles. These poles support antennas/readers that illuminate inward toward the passing vehicles. The poles for the inward and outward looking antennas are offset by 16 feet from each other to avoid interference.

A construction office trailer is located near the platform area. This trailer contains the computers used to administer the tests as well as collect, save and analyze the data. The director for the test operations will oversee the tests from the trailer and observe test operations from that position through windows in the trailer.

Procedures

Testing will include testing of vendor supplied systems in various configurations and for different use conditions as contained described below.

RFID Tag Read Tests

Predefined testing configurations will be executed repeatedly to quantify the performance of each vendor's equipment for a wide variety of use cases and for three configurations of the

supplied RFID reader systems. The test cases will consist of permutations of the following use conditions:

1. Vehicle speed
2. Orientations/Location
3. Window Tint
4. Number of Passengers
5. One or two vehicles
6. Vehicle type
7. Tag Type
8. Tag to tag variability
9. Tag Handling

In addition, as weather permits, operation under inclement conditions will be included. That is, testing will continue under adverse conditions, as long as the Falls Church facility is open and travel conditions in the test lanes is safe.

The RFID reader system configurations to be tested are as follows:

1. Readers and antennas conforming to the FCC's 47 CFR Part 90 rules. That is, systems that operate with a combined effective radiate power (ERP) of up to 30 watts mounted above the travel lanes. This configuration is designated here as an overhead Part 90 configuration.
2. Readers and antennas conforming to the FCC's 47 CFR Part 90 rules, that is mounted on opposite sides of the travel lanes. This configuration is designated here as a side Part 90 configuration.
3. Readers and antennas conforming to the FCC's 47 CFR Part 15 rules. That is, systems that operate with a combined effective radiate power (ERP) of up to 4 watts mounted on opposite sides of the travel lanes. This configuration is designated here as a side Part 15 configuration.

It is noted that systems operated under Part 90 of the FCC rules require site licenses. For the purposes of these tests, an experimental license under 47 CFR Part 5 covering the equipment under test is substituted and will be in place before testing commences.