Glenn Weigh Station Mainline E-Screening

- Section 1: The Goal and Benefits of Mainline Sorting and Pre-screening.
- Section 2: Features
- Section 3: Overview of the Technology Corridor
Purpose of the Glenn Mainline E-Screening System:

The Glenn Mainline E-Screening System is a traffic management system designed to raise the efficiency and overall effectiveness of Commercial Vehicle Enforcement operations. This is accomplished through the use of Dimensional and Credential Pre-screening Technologies… with the aim of providing information necessary to maximize use of finite Enforcement resources… in order to meet the needs of growing demands.
Pre-Screening Tools at Glenn and how are they used?

The Pre-Screening/Sorting System at Glenn utilizes and combines:

- Weigh-in-Motion (WIM) Technology provided by IRD’s Single-Load Cell scales
- Transponder based Automated Vehicle Identification (AVI)
- Video Identification (VID)
- Data-base Management Systems and Technologies
- IRD’s Roadside Operations Computer

...for the purpose of identifying Suspect Vehicles that may not be in compliance with enforceable Dimensional or Credential Ordinances...and removing them from the traffic stream for further inspection while legal carriers are allowed to continue the delivery of goods uninterrupted.
What Are the Benefits

...for Vehicle Enforcement:

- Allows the advantages of technology to raise the efficiency of resources by providing information that allows time and effort to be directed at the most heavily laden vehicles.
- Allows the advantages of technology to raise the efficiency of inspection resources by identifying historically unsafe carriers within the traffic stream.

...for the Trucking Industry:

- Allows Transponder Equipped vehicles that are legally credentialed and legally loaded to proceed or Bypass the Weigh Station, provided their safety history is adequate.
- Allows all trucks entering the Weigh Station to proceed more rapidly through the Weigh Station if legally loaded.
- It evens the playing field by rewarding Companies that go the extra yard in the name of safety.
What are the Benefits to the Public

- Encourages Public Safety by increasing the safety of the travel corridors.
- Encourages Protection of the Public Infrastructure.
The Importance of the Confidence factor in E-Screening

• The degree of success of any mainline sorting system is proportional to the degree of confidence Enforcement personnel have in the enforceable Compliance the system provides.

• At Glenn Weigh Station numerous measures to ensure and enforce Compliance are employed.
Information Flow at Glenn

- Advance
- ICN
- iROC
- CVIEW/safer
- Truck
- Op display/Controls
The Four Stations that Comprise the NB Sorting System:

1. The Advance Location
2. The In-Cab Notification Station (ICN)
3. The Compliance Location
4. The Scalehouse- Static Scale
1. The Advance Location
Purpose of the Advance Location:

- Create the Vehicle Record complete with dimensional quantities such as vehicle length and height; vehicle axle-spacings and axle-groupings and also determine single-axle, group-axle and gross vehicle weights.
- Capture and merge the “DOT” and “Overview” Camera Images to the Vehicle Record.
- Detect, merge and forward to the iROC Transponder information when a transponder is present.
Line 1 Displays: Unique Vehicle Record ID; Vehicle Class; GVW in KIPS (killipounds).
Line 2 Displays: The Sort Decision (Bypass or Report); Speed; Time, allowable GVW.
Line 3 Displays: Axle-Spacings proportionally displayed w/ Overweight Axles highlighted in Red.
Line 4 Displays: Single Axle-Weights in Kips w/ Overweight Axles highlighted in Yellow.
Line 5 Displays: Axle-Group Weights in Kips w/ Overweight Axles highlighted in Yellow.

Important!
Line 6 Displays: The explanation of why the Vehicle received the Report Sort Decision.
Compliance Measures at the Advance Location

The quality of the vehicle record produced is contingent on the correct positioning of the vehicle as it crosses over the scales. At Glenn Weigh Station, the correctness of the vehicle being measured is accomplished through the following means:

1. Off-scale sensors are positioned on the extreme edges of the WIM scales to detect wheels not centered on the scale.
2. Since the WIM scales employ a right and left sensor, weight differential is used as an indicator of vehicle position.
3. The total number of axle triggers registered by the WIM scales must be in agreement. Any disagreement in axle triggers indicates a truck not positioned correctly.

Any vehicle not satisfying the above items are assumed to be avoiding the scales and will not receive the benefit of the bypass. Further the nature of the failure is attached to the vehicle record in order to inform the Officer of the status. The Image of the truck in question is also attached to the vehicle record displayed, supplying visual support of the positioning problem.
The Advance Array & ICN

- Overheight Detector
- Upstream Loop
- Downstream Loop
- DOT Camera
- Overview Cam
- Advance AVI
2. The ICN Array
The Purpose of the ICN

- After the iROC makes a Sort Decision on a vehicle with a System Tag (or Transponder) it is sent the ICN computer.
- The ICN listens for that Tag and then signals it with a Report or Bypass signal when it is detected, regardless of the lane it is traveling in.
The ICN Array

ICN Antenna
3. Compliance Location
The Purpose of the Compliance Arrays are to Track the Vehicle

• The system knows where it instructed the vehicle to go.
• By utilizing sensor arrays at the Weigh Station gore, the system utilizes Vehicle Record matching to determine if it Complied with it’s signal.
• The Operator display notifies station personnel the outcome of this tracking.
The Compliance Array

Upstream Loops

Downstream Loops

Piezo Axle Sensors
How Tracking Works

• When the Truck crosses the WIM the system knows it’s axle spacing profile and the speed in which it travels.
• The system knows the distance to the Compliance Arrays, therefore the system can estimate the approximate time the truck should show up at the Compliance Sensor Arrays.
• It also knows the relative order in which the trucks should appear at the Compliance Arrays.
• When the Vehicle travels over the Compliance Arrays it’s Axle Spacing Profile becomes known and therefore can be matched and compared to it’s original Sort Decision.
• It’s Vehicle Record and image can now be displayed on the Operator Display inside the Scalehouse.
The Operator Display: 3 primary Categories

- Displays on the Left-side Column of the Operator Display the Truck as it goes over the WIM scale…configurable.
- Displays on the Right-side Column of the Operator Display the Trucks as they cross the Compliance Arrays.
- Pop-ups occurs of the Trucks that proceed down the Mainline as they pass the Scalehouse.
Confidence in Compliance through Pop-ups

• One of the most important features of the vehicle display concerns the use of Pop-up Images of all transponder equipped vehicles that bypass the Weigh Station.
• The Pop-ups occurs as soon as the Vehicle commits to a given lane at the sorting gore
• The Pop-up image dwells on the display screen for as long as the vehicle is in the view-scope of the Officers.
• The Pop-ups use color-coded Frames to easily identify the compliance status of the vehicle that is bypassing. Green for legitimate Bypassed vehicles, Red for Trucks running the Scale.
• The Pop-up image of vehicles determined not to be following their transponder signal to report to the Weigh Station can be printed and saved complete with time stamp and transponder information including carrier name.
Vehicle Information: 40565

LANE=5 & SORT_DECISION=3 & STATION_OPEN=1 & CLASS_THRESHOLD>=9

(40565) LANE BYP 2 CLASS 9 WHEELBASE 56.4 ft GVW 30.6 kips
SORT Bypass 46.6 mph TIME 2007-12-11 15:07 MAX GVW 86.0 kips
3.0 4.6 5.7 6.9 10.4
7.5 12.6

Image type: Vehicle Close in (sec): 10 Keep open Close Print
Operator Display Controls

- Allows the Overweight Factor to be modified.
- Allows percent of Random Vehicles to be modified.
- Allows Sorting Control Status to be changed between Bypass, Report, Sorting or Off.
- Select camera image to be displayed.
- Select what lanes are to be displayed in both Columns…currently only vehicles crossing the WIM are in the Left-side column and vehicles traveling in the Compliance Bypass Lanes 1,2 & 3 appears in the right-side column.
- Select and Reset Lane Counts.
Example of Controls

Make sure the Sign Control is placed in Bypass Mode when the Station is Closed!
III. How to determine what Credential Failed

- Double Click on the Vehicle Record, after a moment, an “Original Sreenig Pop-up” occurs that contains 3 useful tabs.
  1. Images (Camera Images and Vehicle record.
  2. Original Screening Criteria (shows the weight and Credential information). This is the Tab that needs to be selected.
  3. Snap Shot.
Double Click on the Vehicle Record selected (wait on the Pop-up Window to launch, this may take a few seconds).
Notice that the Screening Credential failures are highlighted below.

To verify that the Transponder is matched properly to the assigned vehicle, select “Vehicle…” field found beside Snapshot s: below and double click.
Now, Visually match the Transponder ID number (found in the “Transponder ID:” Field found below) with the Physical Description and License Plate number listed, also check against the DOT number as well.