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# GPS TO ODOMETER RECONCILIATIONS

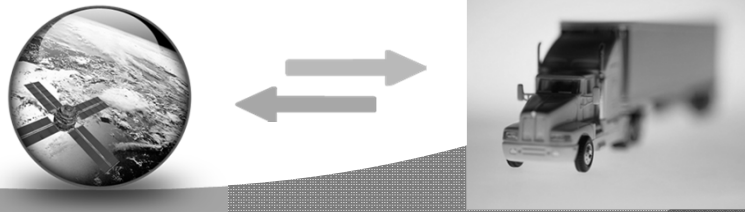
(ODOMETER OR NO ODOMETER?)

## Purpose

- ◎ Provide examples of actual electronic data showing:
  - Some of the data elements that can be captured;
  - Viewing the data for understanding;
  - Comparison of reported and audited distance for both jurisdictions and in total; and
  - Help to form an educated analysis of the correlation between how often the position is recorded and the need for a meter reading.

## GPS Basics

- ⦿ A device is installed on the vehicle
- ⦿ The device collects a data “ping” showing its location on the surface of the earth
- ⦿ The ping is associated to a time/date when it was recorded.



## GPS Basics

- ⦿ During last year’s Workshop, we learned that in order to determine a position, 4 satellites are needed for land-based vehicles.
- ⦿ The receiver clock accuracy is critical because it records the reception time of the signal , which is the beginning of the position calculation.

## Accuracy

	Latitude	Longitude
1 degree	69 miles	42 miles
1 minute	6072 ft	3696 ft
1 second	101.2 ft	61.6 ft
Degrees		
0.1	36432 ft	22176 ft
0.01	3643.2 ft	2217.6 ft
0.001	364.32 ft	221.76 ft
0.0001	36.43 ft	22.18 ft
0.00001	3.64 ft	2.22 ft
0.000001	4.37 In	2.66 In
0.0000001	0.44 In	0.27 In

## Data Collection

- ⦿ After the basic data (Vehicle #, Time/Date, Latitude and Longitude) it is the option of the device provider and the purchaser of the system what information is collected and stored.
  - Nearest City State to ping
  - Engine statuses
  - Trip number
  - Frequency of ping data
  - Odometer or meter reading



## Requirements IRP

- ◎ IRP Requirements (7-1-2013 )
  - **For Records produced wholly or partly by a vehicle tracking system, including a system based on global positions system (GPS),**
    - the original GPS or other location data for the vehicle to which the Records pertain
    - the date and time of each GPS or other system reading
    - the location of each GPS or other system reading

## Requirements IRP-Cont

- the beginning and ending reading from the odometer, hub odometer, engine control module (ECM), or any similar device for the period to which the Records pertain
- the calculated distance between each GPS or other system reading
- the route of the vehicle's travel
- the total distance traveled by the vehicle
- the distance traveled in each jurisdiction
- the Vehicle Identification Number or the vehicle unit number

## Requirements IFTA

### ◎ **\*P640 DATA COLLECTION REQUIREMENTS**

To obtain the information needed to verify fleet distance and to prepare the "Individual Vehicle Distance Record", the device must collect the following data on each trip.

#### ◎ **.100 Required Trip Data**

- .005 Date of Trip (starting and ending);
- .010 Trip origin and destination (location code is acceptable);
- .015 Routes of travel or latitude/longitude positions used in lieu thereof (may be waived by base jurisdiction). If latitude/longitude positions are used, they must be accompanied by the name of the nearest town, intersection or cross street. If latitude/longitude positions are used, jurisdiction crossing points must be calculated or identified;

## Requirements IFTA-Cont

- .020 Beginning and ending odometer or hub-odometer reading of the trip (may be waived by base jurisdiction);
- .025 Total trip distance;
- .030 Distance by jurisdiction;
- .035 Power unit number or vehicle identification number;
- .040 Vehicle fleet number; and
- .045 Registrant's name..

## Odometers

- ⊙ Readings may come from:
  - Odometers
  - Hub-odometers
  - ECM (Engine Control Modules)
  - Or any other similar device
- ⊙ Some systems will collect readings electronically while other systems will require manual entry.
- ⊙ The big question – Is there a need for the readings?
  - ECM
  - Is there a need for a dashboard odometer?



## Example 1 – No Odometers

- ⊙ Raw Data
  - How often is the data captured?
  - What is missing?
  - Do you need an odometer?
- ⊙ Routed Data (Map) (Points) (Route)
- ⊙ Audit Data
  - Does this add clarity to the Raw Data?
  - How would you verify it's accuracy?
  - Does it meet IFTA/IRP requirements?
  - Allocation of miles to dash odometer

## Example 2 - Odometers

- ◎ Raw Data
  - How often is the data captured?
  - What is missing?
- ◎ Routed Data (Map) (Points) (Route)
- ◎ Audit Data
  - Does this add clarity to the Raw Data?
  - How would you verify it's accuracy?
  - Does it meet IFTA/IRP requirements?

## Example 3 - Hourly Pings

- ◎ Raw Data
  - Hourly Pings
  - No Odometer
  - What is your comfort level with this data
    - How would you feel if the fuel matched the route?
    - The Miles per gallon was low?
    - The Miles per gallon was high?

# Questions

