Department of Environmental Protection

Air Quality, Energy & Sustainability (AQES)

VIN Decoding for MOVES Inventory Runs and FLEET Classification

TOM DVORAK- NJDEP BUREAU OF MOBILE SOURCES
DENISE CORMIER- MAINE DEP

Agenda

- ❑ VIN Structure
- ❑ Partial VINs
- ❑ VIN Source: State Vehicle Registration Databases
- ❑ Registration PII Data Security Issue
- ❑ Registration Fields to Request
- ❑ NHTSA Product Information Catalog (vPIC)
- ❑ SourceType from Decode/Registration Data

VIN Structure

Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ISO 3779	World manufacturer identifier			Vehicle descriptor section						Vehicle identifier section							
European Union[7] more than 500 vehicles/year	World manufacturer identifier			Indication of "*the general characteristics of the vehicle*"						Indication that provides "*clear identification of a particular vehicle*"							
European Union[7] 500 or fewer vehicles/year	World manufacturer identifier		9	Indication of "*the general characteristics of the vehicle*"						Indication that provides "*clear identification of a particular vehicle*"							
North America more than 2,000 vehicles/year	World manufacturer identifier			Vehicle attributes					Check digit	Model year	Plant code	Sequential number					
North America 2,000 or fewer vehicles/year	World manufacturer identifier		9	Vehicle attributes					Check digit	Model year	Plant code	Manufacturer identifier			Sequential number		

17 alpha-numeric fields describe: Vehicle Make, Model, Year and unique vehicle serial number

Source: https://en.wikipedia.org/wiki/Vehicle_identification_number#World_manufacturer_identifier

Partial VINs

Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ISO 3779	World manufacturer identifier			Vehicle descriptor section						Vehicle identifier section							

Using the VIN characters in positions 1 through 8 along with positions 10 and 11 allows the identification of important vehicle parameters used in identifying the **sourcetype** of the vehicle:

- Partial VIN characters can provide the vehicles: Make, Model, Model Year, Trim Level, Fuel Type, GVWR Class, Body Type, Vehicle Type, etc.
- Many vehicles have the same Partial VINs. Isolating unique Partial VINs with a sample VIN, reduces the need to decode all individual VINs in a fleet one at a time
- Use unique Partial VINs from registration data to decrease decode volumes and times

VIN Source: State Vehicle Registration Databases

Where do you get the VINs?

- The good news, it's in the state government vehicle registration database
- The bad news (usually), it's in the state government vehicle registration database

Getting regular extracts of registration data can be difficult for various reasons:

- Many state registration databases are in old mainframe systems with antiquated code, this makes creating a program to extract the data and running it on a regular basis difficult and/or expensive
- Bureaucratic policies including fear of PII Data Security liability

Registration PII Data Security Issue

The PII Data Security issue is a serious concern, legal issues can be addressed by referring to:

18 U.S. Code § 2721 - Prohibition on release and use of certain personal information from State motor vehicle records.
Section (B), Paragraph 2 - (b) Permissible Uses.—Personal information referred to in subsection (a) shall be disclosed for use in connection with matters of motor vehicle or driver safety and theft, motor vehicle emissions, …, the Clean Air Act (42 U.S.C. 7401 et seq.), and chapters 301, 305, and 321–331 of title 49, and, subject to subsection (a)(2), may be disclosed as follows:

(1) For use by any government agency, …, in carrying out its functions, or any private person or entity acting on behalf of a Federal, State, or local agency in carrying out its functions.
(2) For use in connection with matters of motor vehicle or driver safety and theft; motor vehicle emissions;…

Recommendations:

- Limiting data requested to minimize or eliminate PII data elements
- Follow local state requirements for storing PII information, such as password protection along with encrypted (i.e., Bitlocker) drives

Registration Fields to Request

States vary in how they collect and store vehicle registration data.

The frequency of database downloads should be at least yearly, preferably quarterly or monthly.

Here are some key field elements to request to help classify vehicle **SourceType**:

- **VIN** and **Plate**, and if available **Plate Type**
- **Registration Type**- i.e., commercial, government, personal, etc.
- **Year, Make, Model**- may need to be used if there is no VIN decode
- **Vehicle Registered Weight**- may help if no GVWR in VIN decode
- **Vehicle Type**- Can be useful for heavy duty vehicles
- **Owner Information**- Use Non-PII data such as ZIP code, but no street address. If you can get names or other ID of commercial entities, this is very helpful.

NHTSA Product Information Catalog (vPIC)

The Product Information Catalog and Vehicle Listing (vPIC) application is a platform the National Highway Traffic Safety Administration (NHTSA) uses to present data collected from vehicle manufacturers.

- NHTSA maintains the reporting requirements from the manufacturers, VIN standards and regulations. This is the main source for many VIN decoding applications.
- vPIC has no proprietary data sharing restrictions.
- States have full access to the entire set of data elements in the decoded table. This is essential for fuel type mapping and alternative fleet profiles (Electric vehicle types- BEV, PHEV, HEV).

NHTSA Product Information Catalog (vPIC)

vPIC decode data includes over 130 possible fields. Not all fields are populated for each VIN.

vPIC will try and determine best possible decode if one or more characters are incorrect.

Fields returned are grouped into the following categories:

- **General**: Make, Model, Model Year, Trim, Vehicle Type …
- **Engine**: Displacement, Fuel Type, Model…
- **Exterior**: , Body Class, Doors, GVWR, Length, Tires…
- **Mechanical**: Battery info, Drive Type, Axles, Transmission…
- **Safety**: ABS, TPMS, Blind Spot Detection, Seat Belts, Air Bags…

Useful **MOVES** fields – Make, Model, Year, Trim, GVWR, Vehicle Type, Body Class, Fuel Type primary, Fuel Type secondary, Seats, Axles

NHTSA Product Information Catalog (vPIC)

vPIC single VIN decoder- https://vpic.nhtsa.dot.gov/decoder/

vPIC API location- https://vpic.nhtsa.dot.gov/api/

- Use distinct partial VINs from fleet to decrease decode times
- vPIC three output formats available: XML, CSV, JSON
- All importable into local database (MySQL, Maria, Oracle)

vPIC will take incorrect VINs and identify decode with suggested corrections where possible. Will note the suggested correction with the fields: Suggested VIN, Error Code, Possible Values, Error Text and Additional Error Text

vPIC is currently being used by New Jersey DEP and Maine DEP for fleet classification

SourceType from Decode/Registration Data

Combinations of Registration data and Decode fields to identify **SourceTypes**:

- Use Registration Type/Plate Type to identify commercial vehicles. Owner info can help.
- Apportioned registration/plates can be moved to long haul types 52 vs 53 or 61 vs 62
- Buses may have special registration/plate categories owner info and even color may help with 43 identification
- Decode data with registration/owner type can identify SourceType 31 vs 32
- Motor Homes may have their own registration indicators to get type 54
- Zip codes from registration data is a way to group SourceType by county
- Motorcycles, off-road and nonroad vehicles can be revealed in decode data, registration data or both sources

Questions?

Tom Dvorak
NJDEP
Air Quality Division
Bureau of Mobile Sources
tom.dvorak@dep.nj.gov