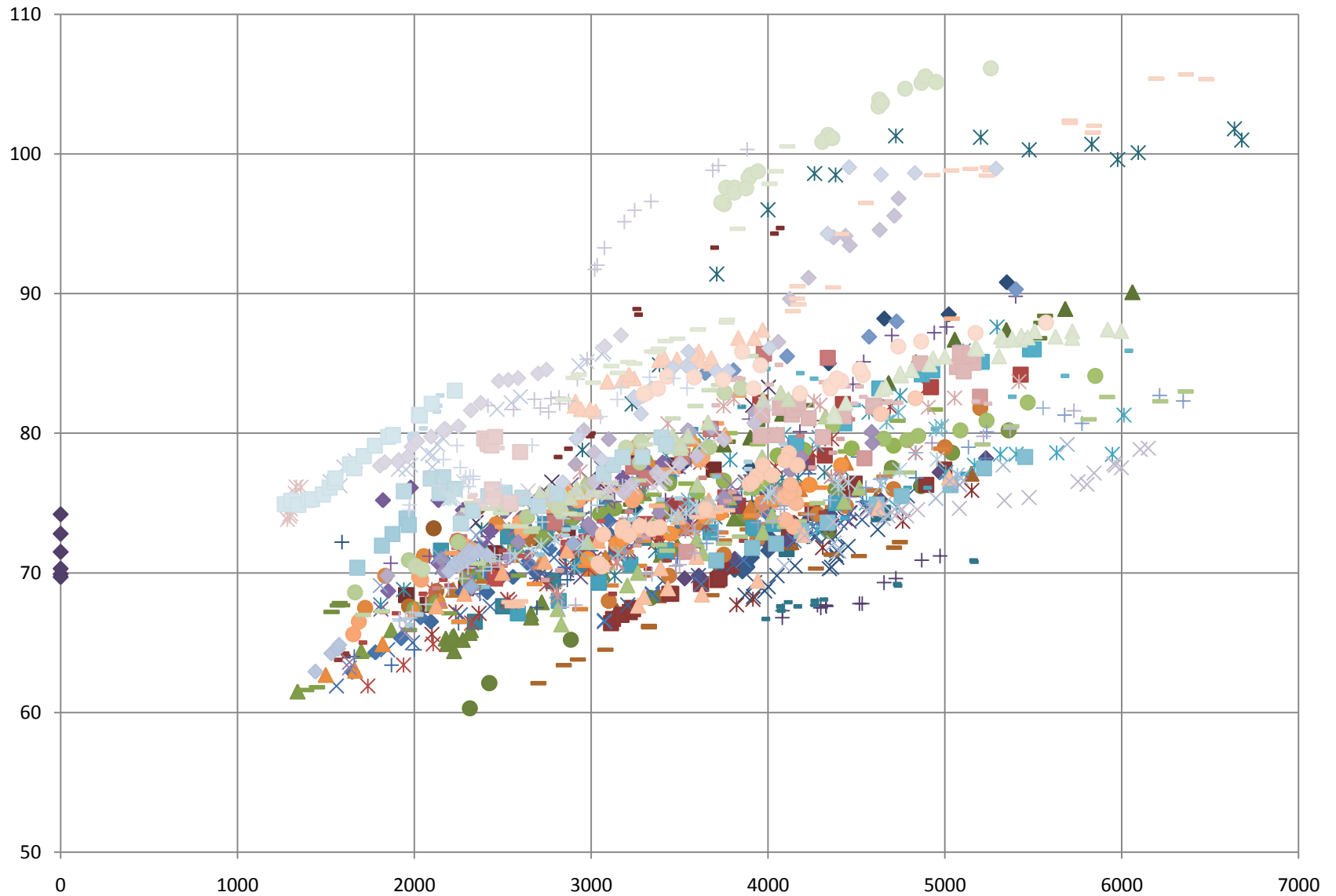# The ASEP Forest

Doug Moore

December 2009

# Status

- ASEP discussions and procedure developed around single car data.

- No common view, or at least no official decision of the ASEP IG, on what constitutes a "Vehicle of Concern" and why.

- ASEP discussions interrelated with the Annex 3 compliance test.

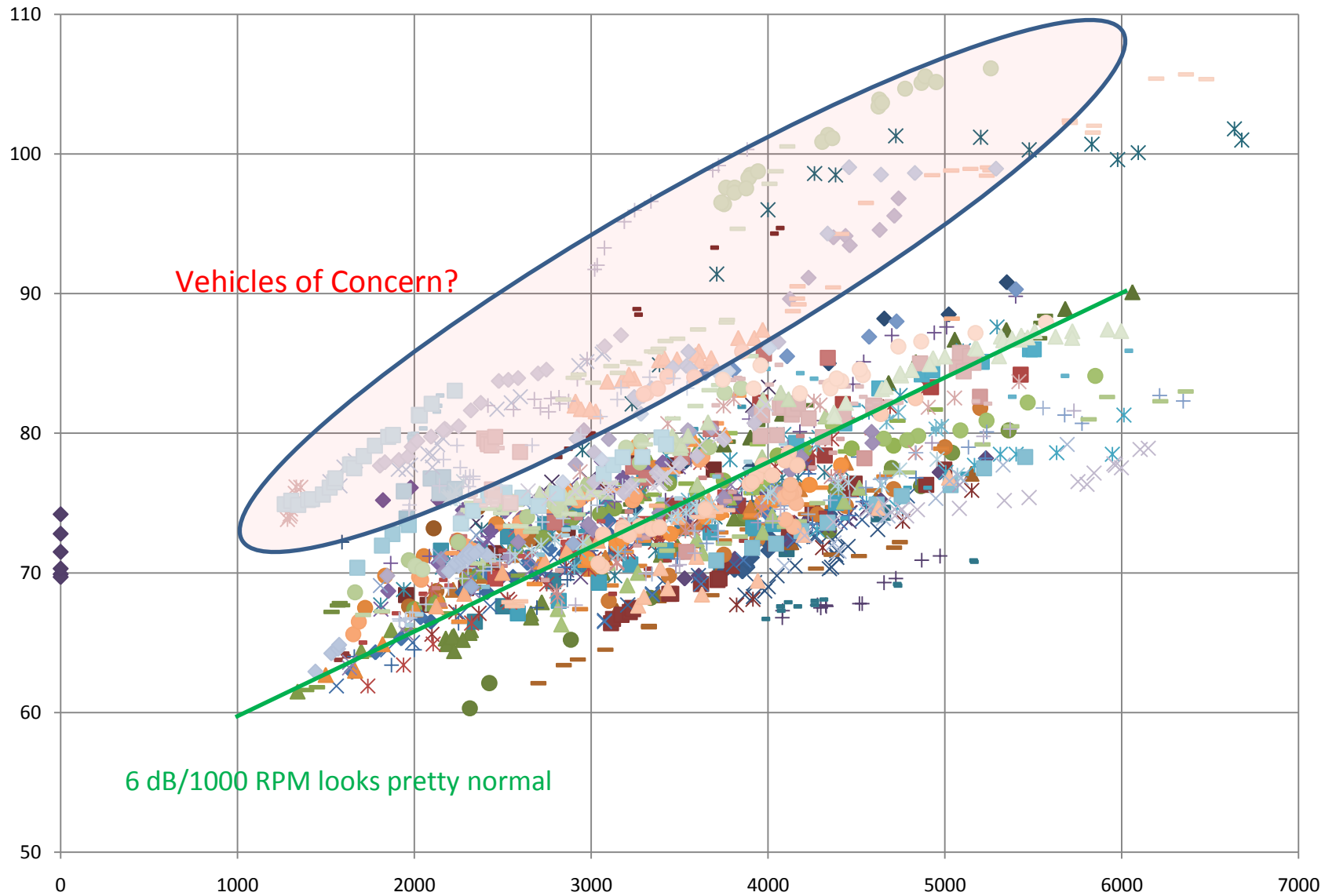- Alternative ASEP proposals presented at September 2009 GRB.

# Motivation

- Step back and consider ASEP with a fresh approach.
- Consider all discussion to the present.
- Look to define "A Vehicle of Concern".
- Understand the larger picture.
  - What type a behavior may be related to design, technology, or other factors?
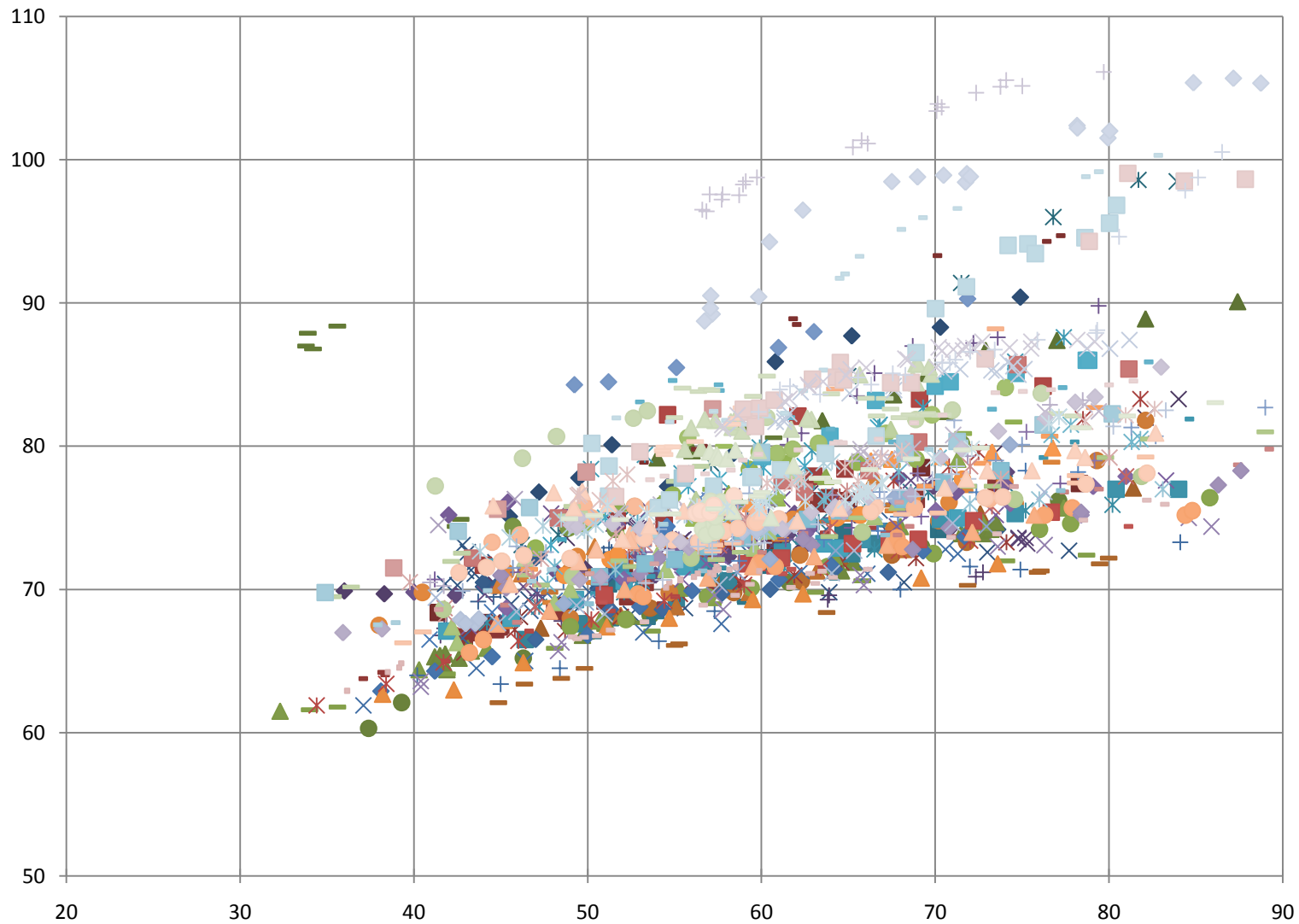  - To understand "Abnormal", need to understand "Normal".
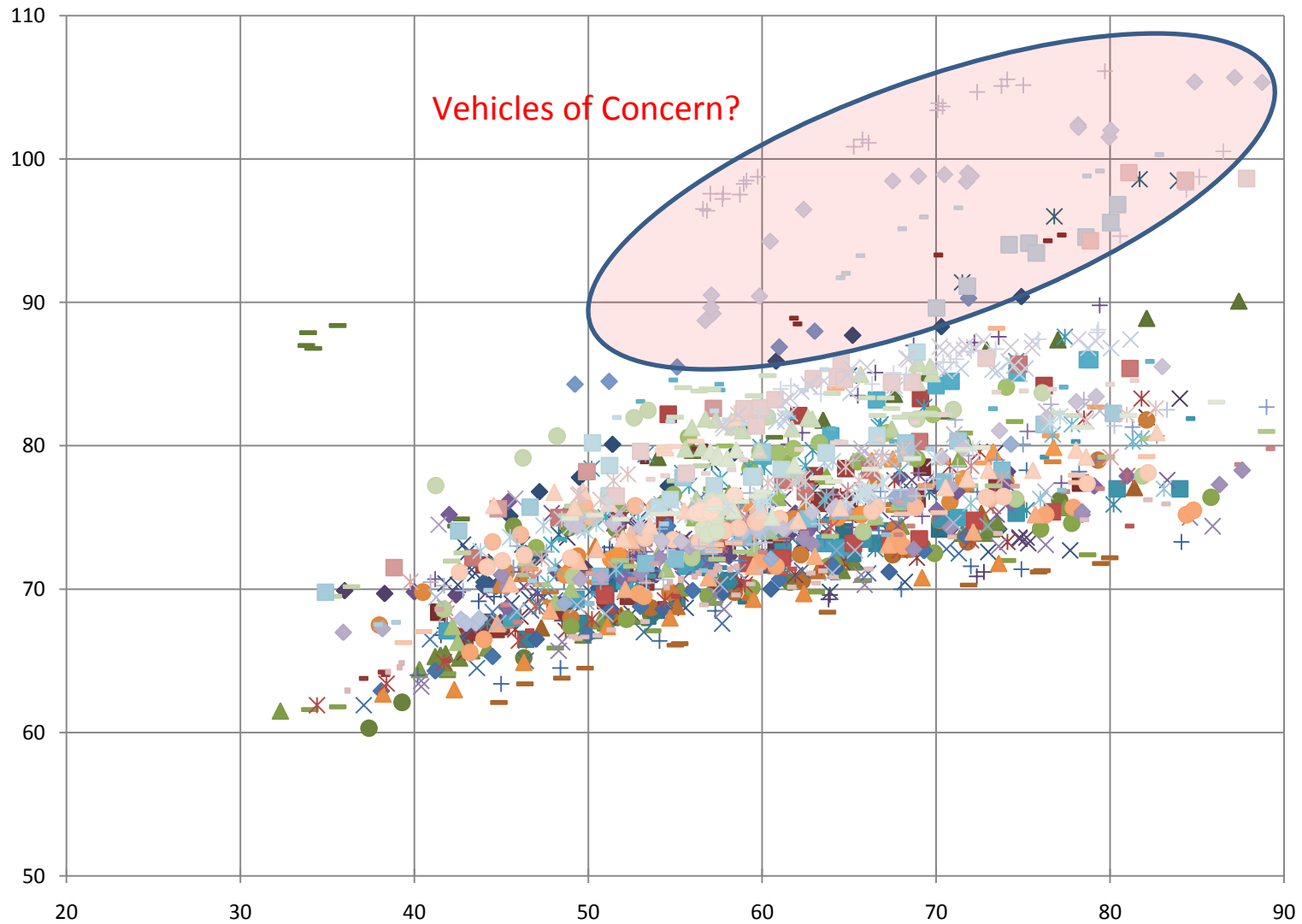
# View of Forest #1 - RPM

# View of Forest #1 - RPM



Vehicles of Concern?

6 dB/1000 RPM looks pretty normal

View of Forest #2 - KPH
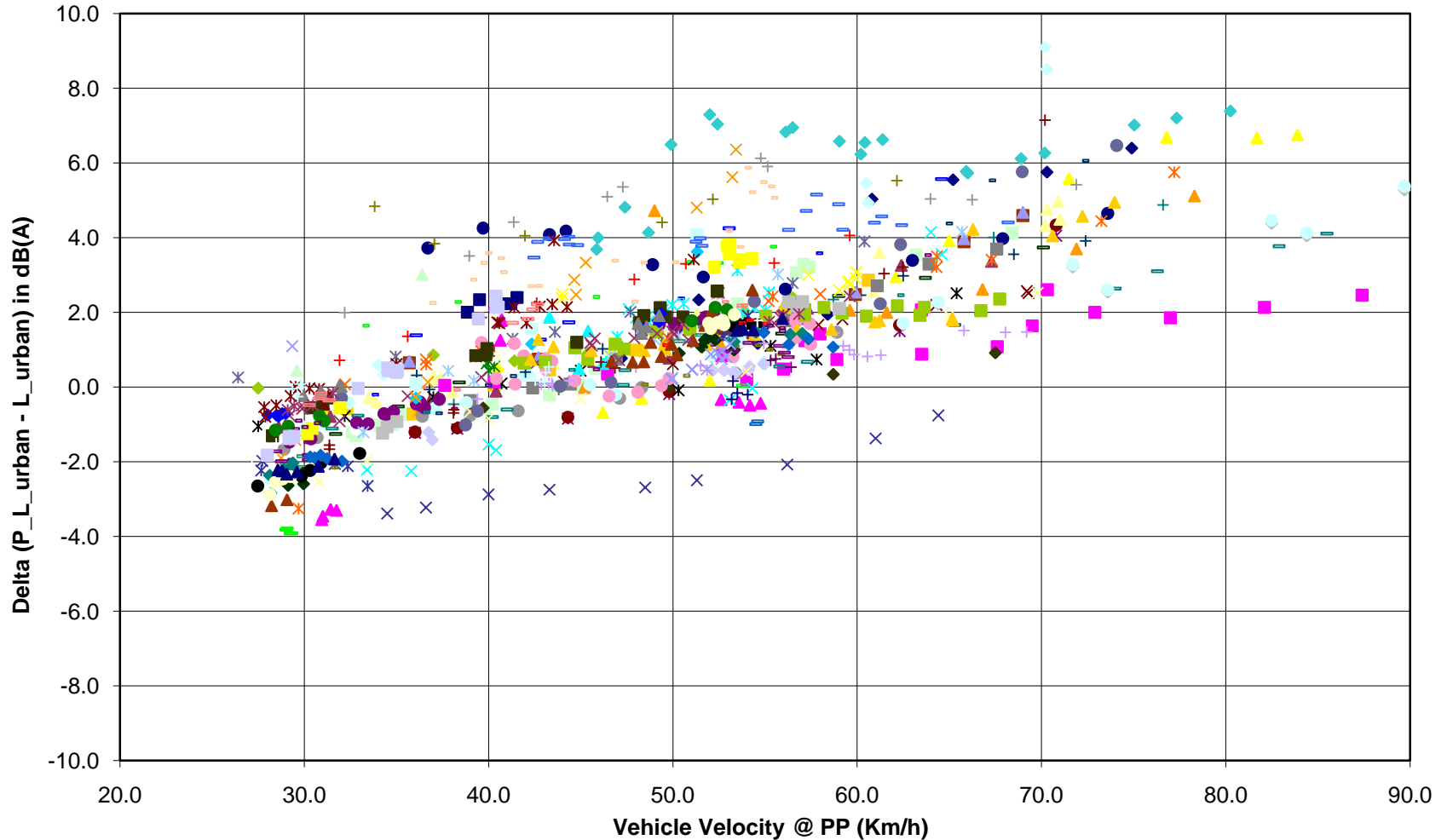
# View of Forest #2 - KPH



Vehicles of Concern?

# L_Urban Analysis Concept

1. For each ASEP test point, calculate a "Pseudo L_Urban" per the 1-gear formula of ISO 362-1.

   – Use L_crs from L_Urban calculation

2. Compare this "Pseudo L_Urban" to the reported L_Urban for the vehicle. The result is "Normalized L_Urban".

   – Normalized L_Urban = Pseudo L_Urban – L_Urban

3. Determine any necessary vehicle speed (Tire) correction. If necessary, calculate a "Corrected L_Urban".

   – Corrected L_Urban = f(Normalized L_Urban, Vehicle Velocity)

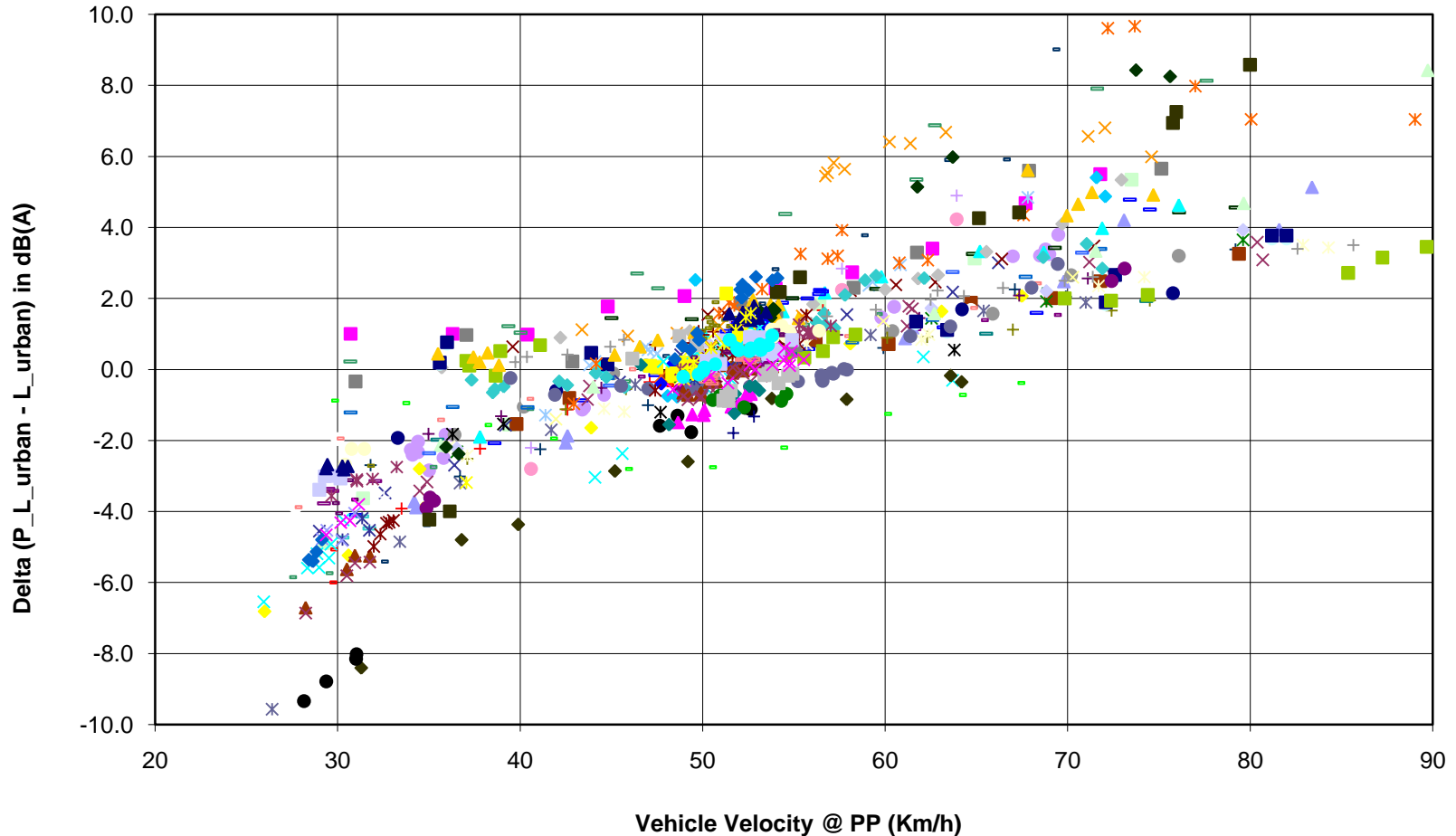4. Analyze data at each step to evaluate "Vehicle of Concern" issues.

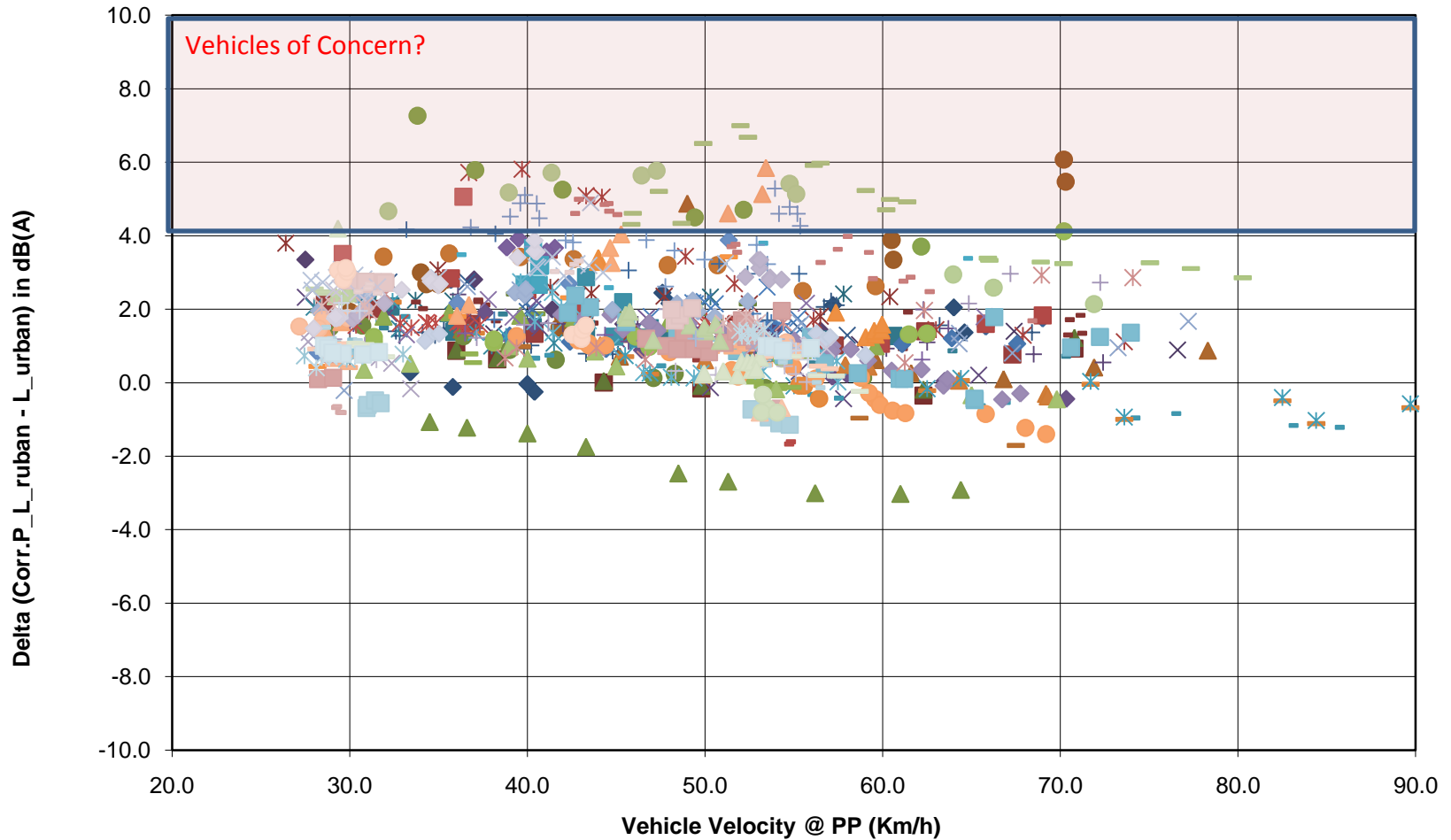# View of Forest #3.1 –L_Urban

**Normalized L_Urban (Gear2, Kp >-0.5)**



Y-axis: Delta (P_L_urban - L_urban) in dB(A)

X-axis: Vehicle Velocity @ PP (Km/h)

# View of Forest #3.2 –L_Urban

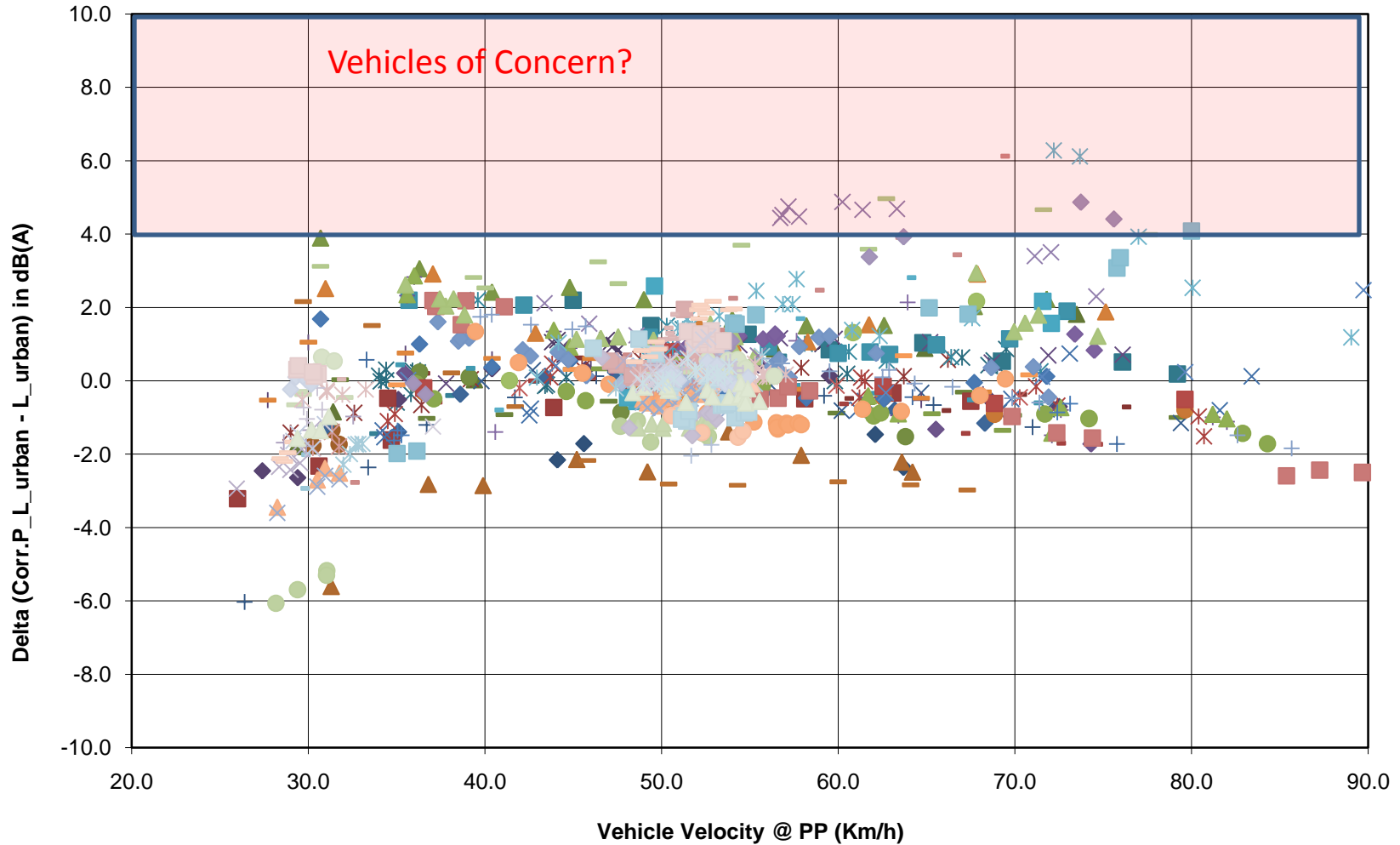**Normalized L_Urban (Gear3, Kp > -0.5)**

# View of Forest #3.3 -L_Urban

**Corrected Normalized L_Urban (Gear 2, Kp > -0.5)**

# View of Forest #3.4 –L_Urban



**Corrected Normalized L_Urban (Gear3, Kp > -0.5)**

# Comments

- When looking at the ASEP data this way, things look a bit different
  - RPM, while important, does not give the complete picture
  - Vehicle speed and acceleration are also needed to understand off-cycle noise emission in context.

- L_ Urban is a useful metric

# Comparison to R28

- R28 mandates installation of an "Audible Warning Device".

- How does this look compared to ASEP?

# Comparison to R28



MINIMUM