

**ROVER**

**Been There ...**

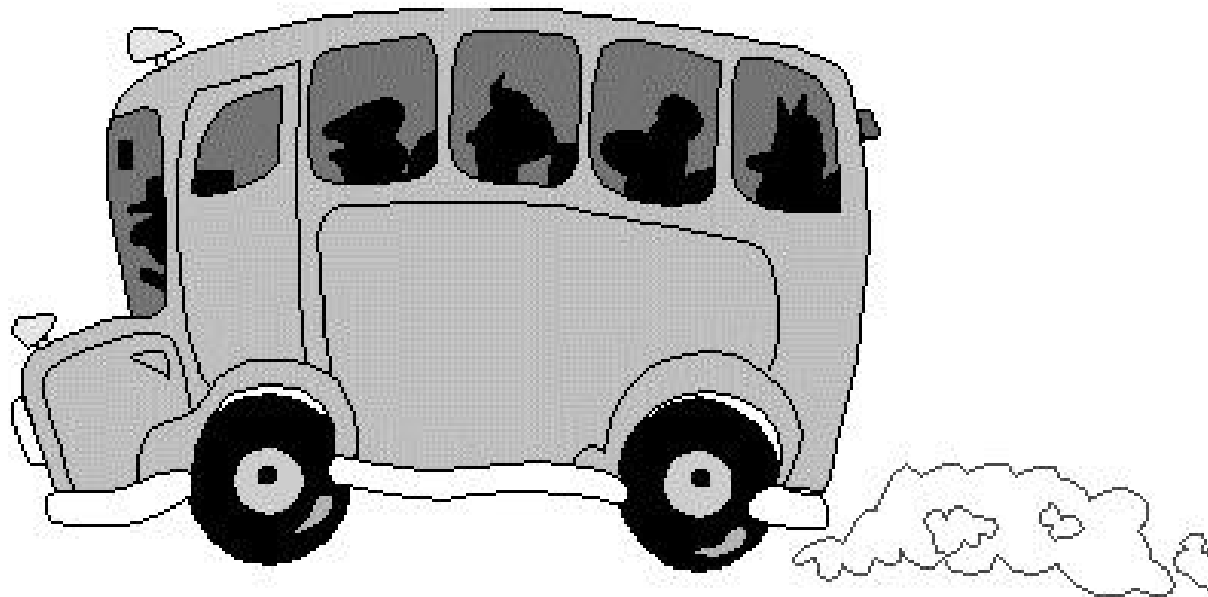
**Recorded That**

A Description of the

*Real-time On-road Vehicle  
Emissions Reporter*

Dennis Johnson, US EPA

# 10 Years Ago



# Invented by Leo Breton in 1995. FTP Correlation Demonstrated.

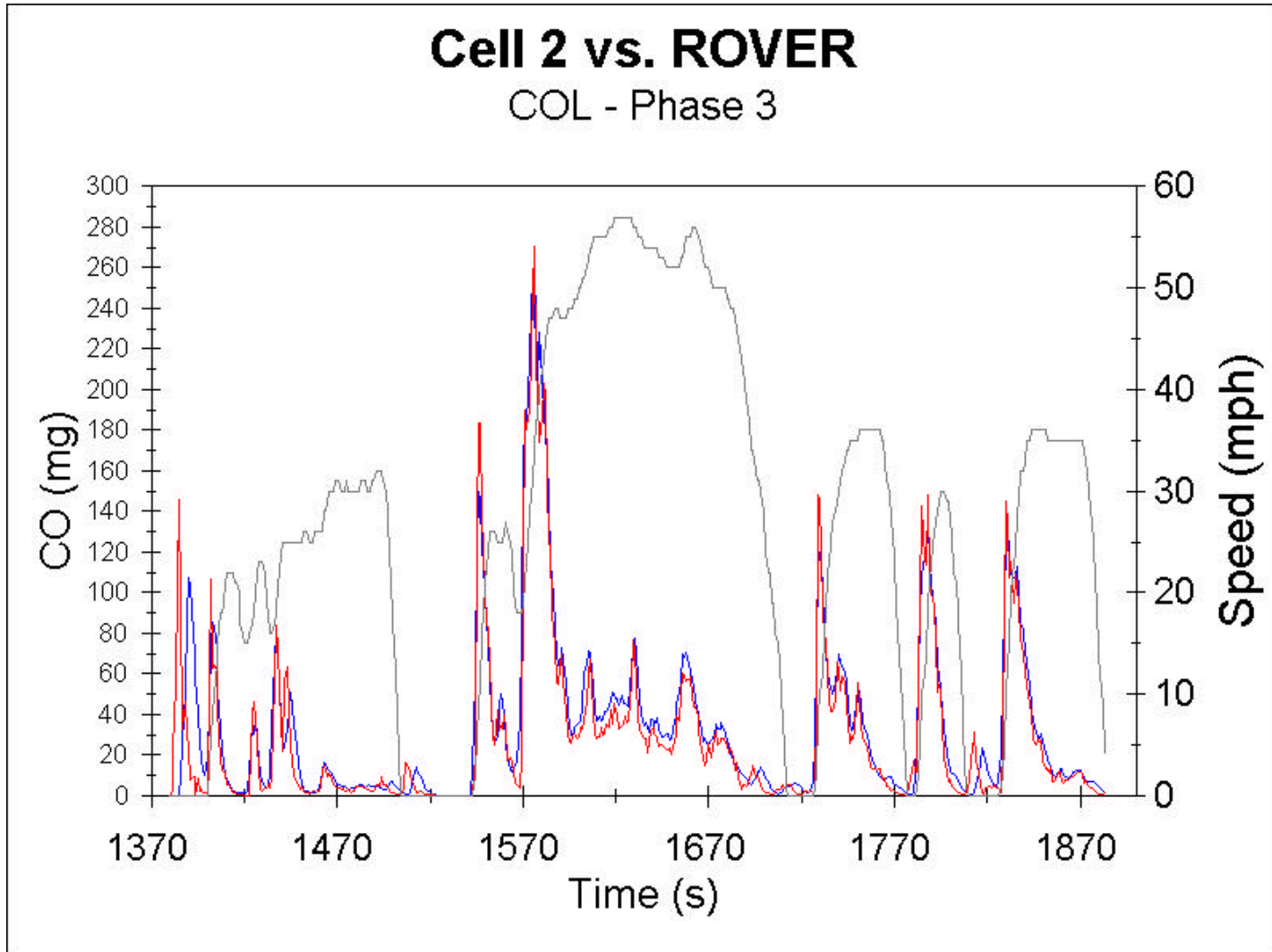


# Demonstrated on Different Technologies.



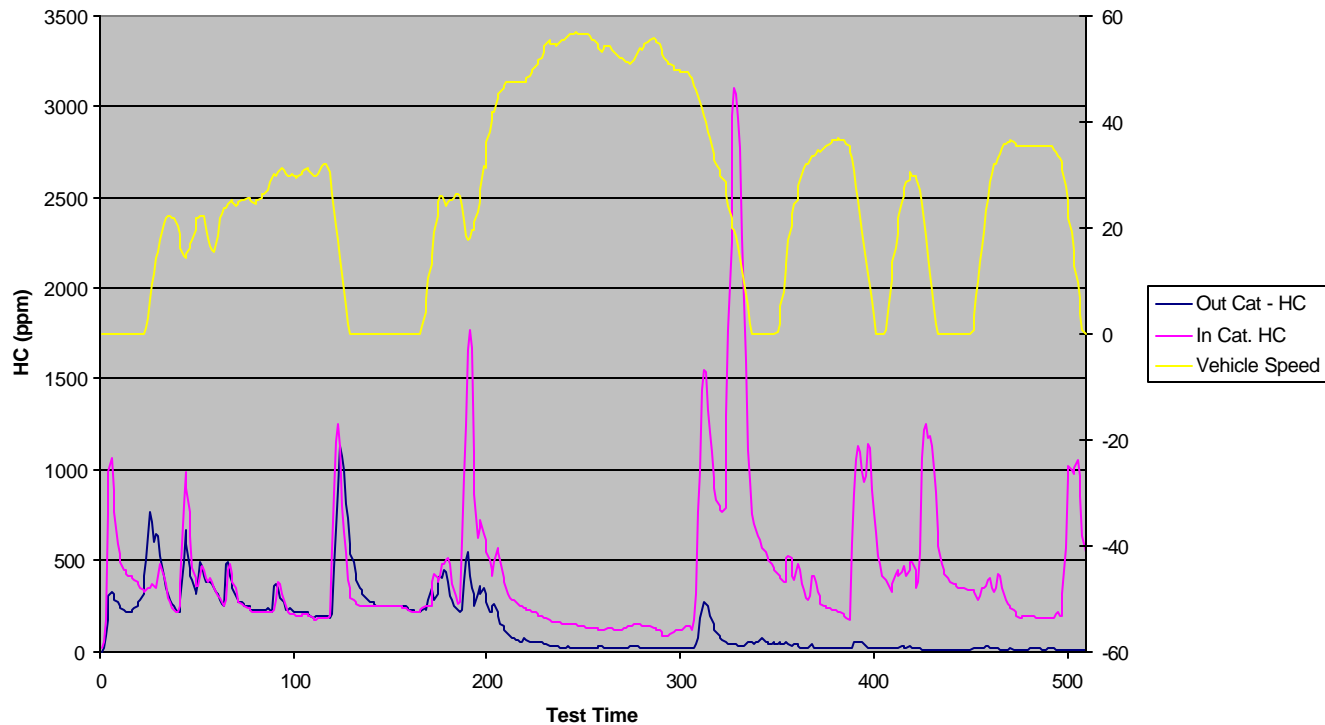
- Accurate
- Mass Emissions Measurement
- Vehicle and Engine Data

# Lab Correlation



# Diagnositics Ready

## Phase 1 Catalyst Efficiency Test 30 April 1999







# On-road Testing

- Real Time Display
- Emissions
- NTE & gm/mi





# Nonroad Testing



# 1998 Off-Road Testing



# Over Six Years

LDV & LDT

HD Gas & Diesel

CNG

Nonroad

Enforcement

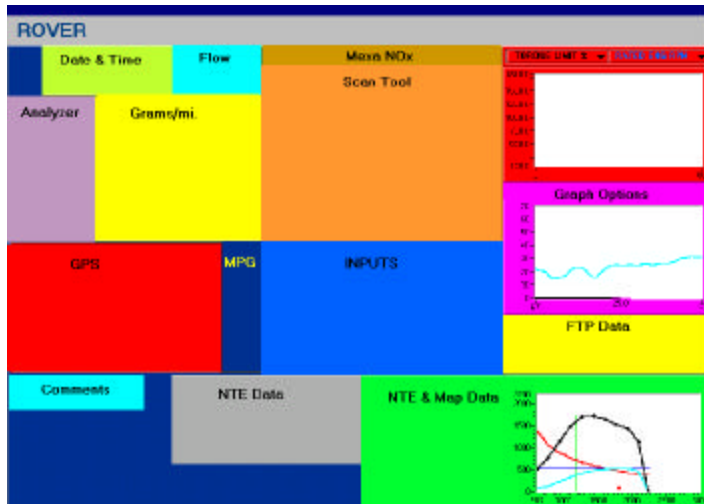
Diagnostics

Recall

Modeling



# Real Time Display



- NTE - gm/bhp-hr
- Mass Emissions
- gm/mi
- gm/bhp-hr
- Exhaust Flow
- Drive Route - FTP
- Vehicle & Engine Data



# Portable, Modular & Versatile

Smoke  
&  
RPM  
Options



# Who Wants In-use Testing?

EPA

NESCAUM

Moscow

States

Retrofitters

Universities

Many More





# So what does Real-time On-road Vehicle Emissions Reporter really mean?

- Flexible
- Many Inputs
- Real Time
- Confidence
- Data



# Where are we now? (10 Years Later)

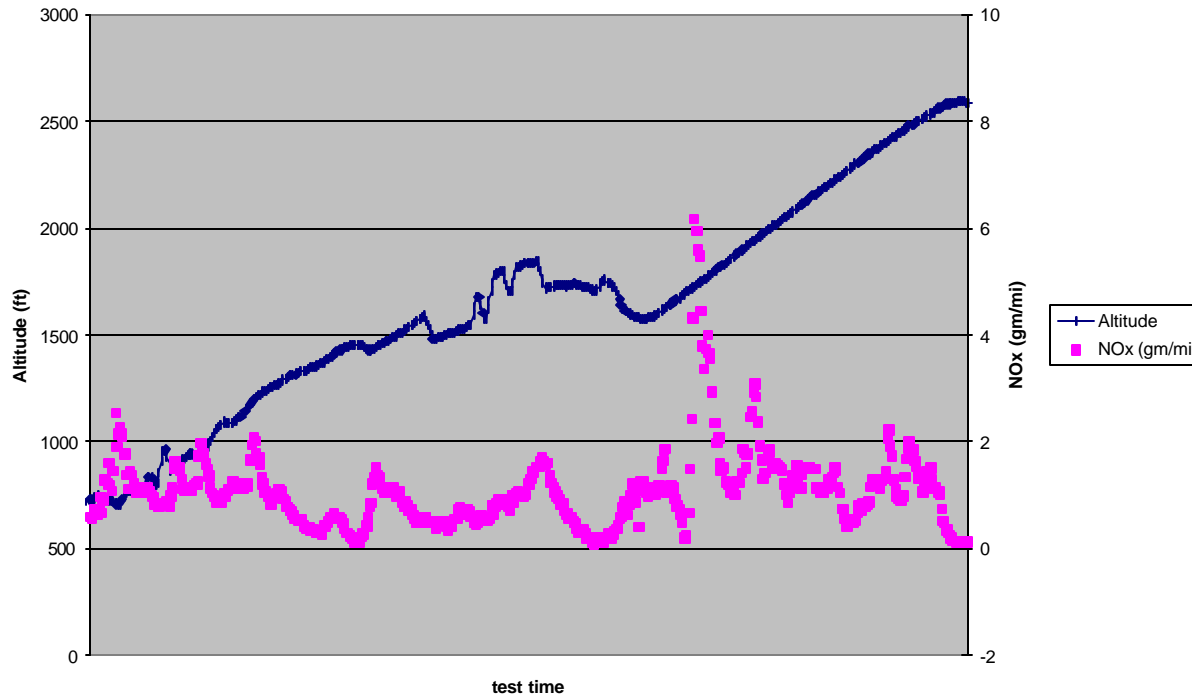
Have Tested...



From Small to Big.

# With ROVER You Can Say...

## 1999 Highway Driving in Western Maryland



Been There ... Recorded That.