RSG INC.
RESOURCE SYSTEMS GROUP, INC.

My Experiences with the Chevy Volt

Prepared for:
Upper Valley TMA

Ken Kaliski, P.E., QEP, INCE Bd. Cert.,
17 September 2012

Outline

- My Volt
- Benefits
- Avoided air emissions
- Noise
- Optimizing efficiency
- How workplaces can help

Plug-in hybrid

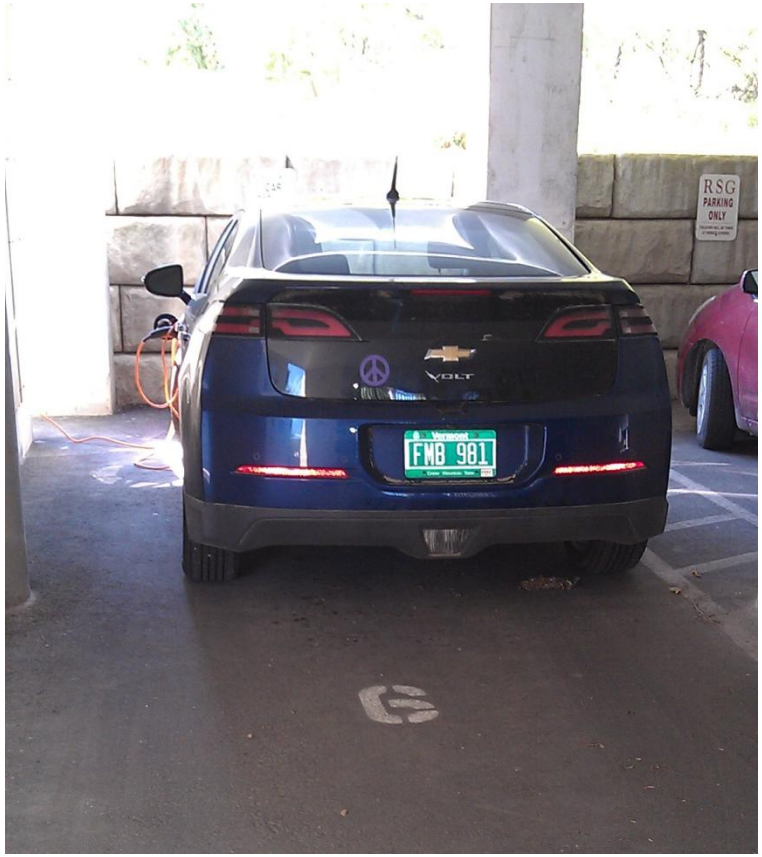
- The Chevy Volt is an “electric car with range-extending generator” (really a plug in hybrid)
- It operates fully on electricity until its charge is depleted (after 30 to 45 miles, depending on weather and roads)
- Vehicles have virtually no engine noise while running on electricity – all tire noise

My Volt

- Purchased in November 2011
- To date
  - 14,330 Miles
  - 7,409 of which are all electric (52%)
  - Averaging 71 mpg
- Use standard 115 V outlet to plug in at home and at work (when I get the space with the outlet)
- Have driven as far as NYC and Maine
- 300+ mile range on a full tank of gas and electric
- Loaded with electronics
  - Front and rear sensors, backup camera, Nav, remote access, OnStar, keyless operation
  - Normal, sport, and mountain modes
  - Lots of support from Chevy

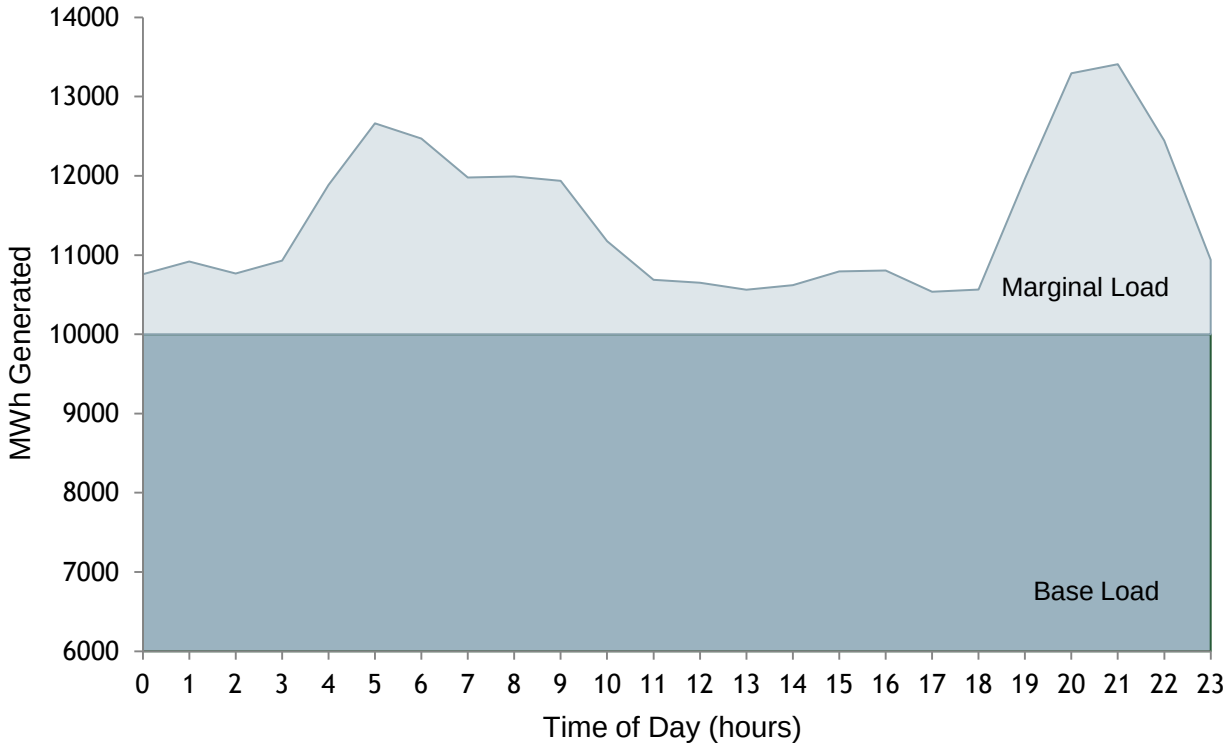
Benefits

- Lower fuel costs
  - Assuming 7,409 electric miles, $4 per gallon, and 30 mpg of my Volvo, $990 in fuel savings in 10 months
  - Offset by about 1,852 kW at $0.14 per kW, or $260
- Caveats
  - I am buying Cow Power at home for $0.04 more
  - I recharge at work when I can

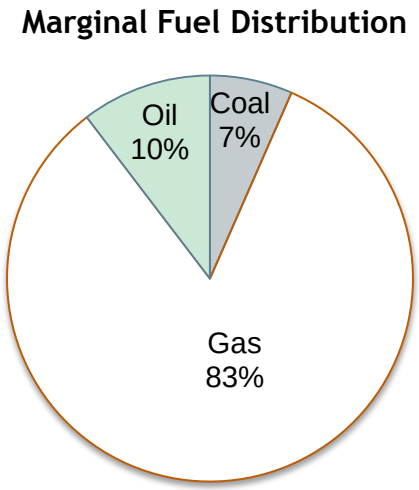


Marginal vs Base Load

- A typical summer day in the New England ISO
- Gas dominates marginal generation in the New England ISO

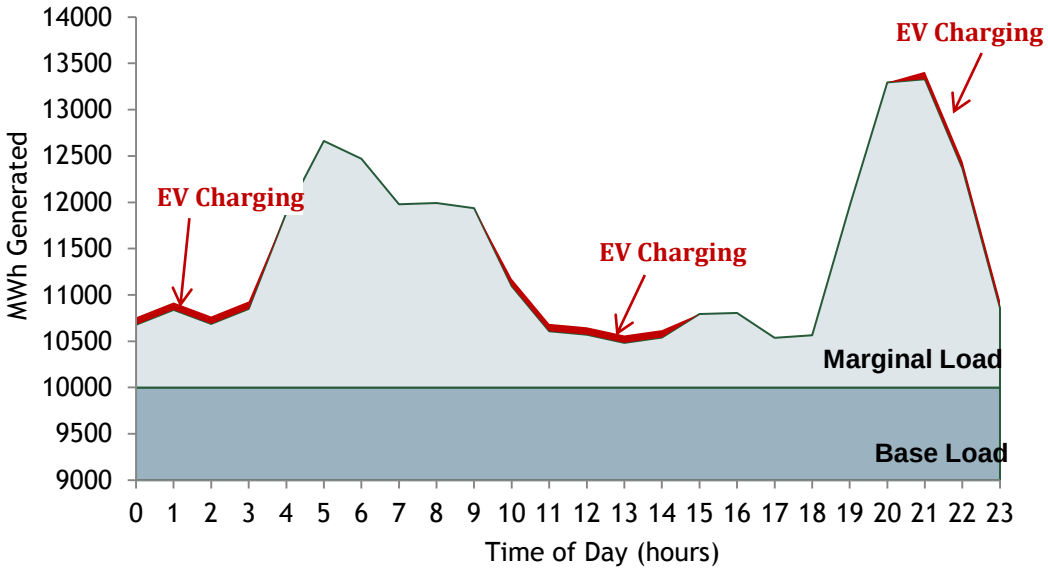


Daily Generation by Base and Marginal Load for a typical summer day in New England ISO



EV Charging Profile

~87,600 MWh of annual EV charging



Total Annual Avoided Emissions (tons per year)

	MWH	NOx	SO2	CO2	PM	N2O	CH4
Gas	67,924	6	5	30,411	23	0.1	0.6
Oil	8,508	8	27	8,289	3	0.1	0.7
Coal	10,987	8	45	12,560	4	0.2	0.2
Annual	87,576	22	77	51,486	29	0.5	1.6

Comparison of Chevy Volt modes and a Prius Hybrid

- Preliminary conclusions for a 30 mile round trip commute (VT)

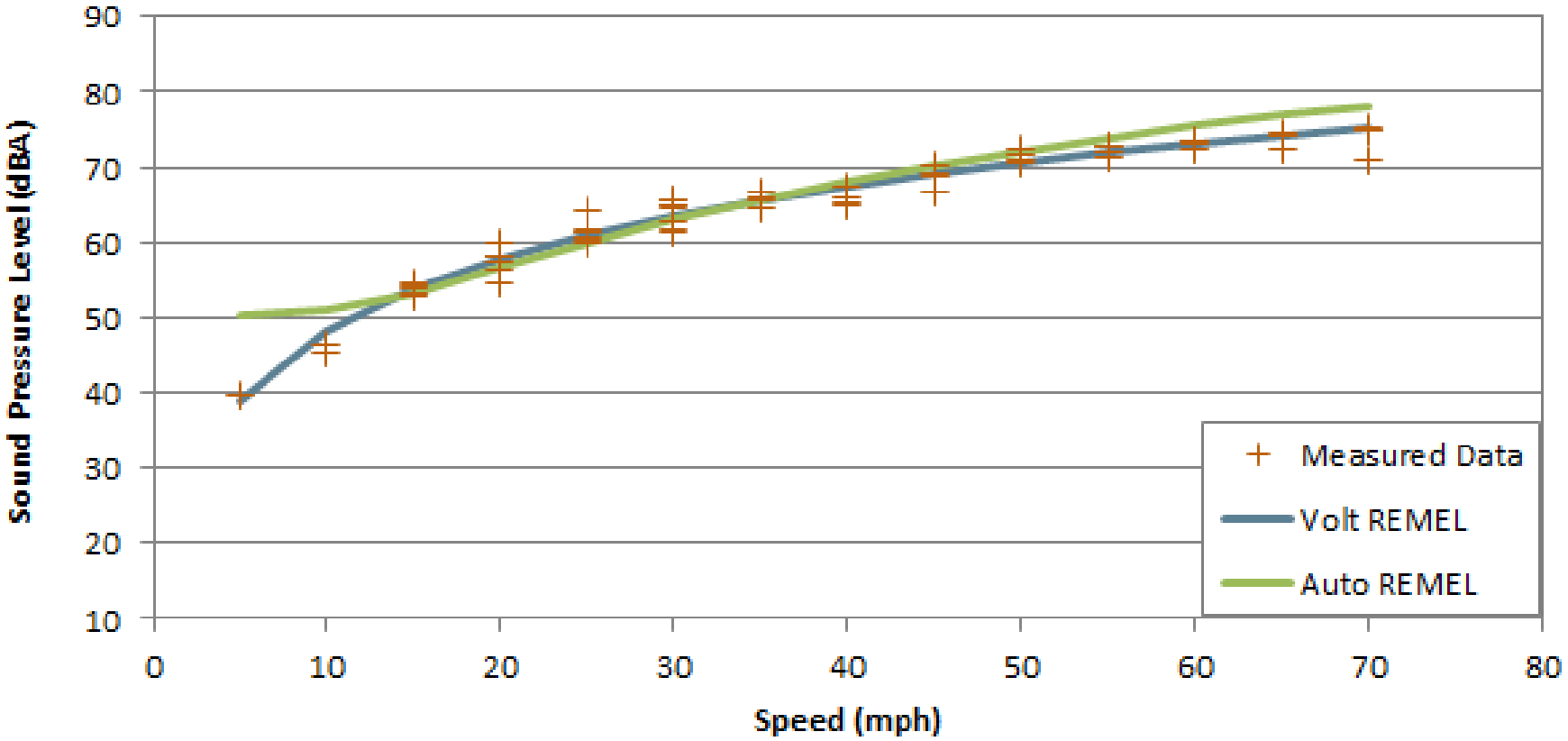
- Chevy Volt in electric mode for 30 miles costs $1.05 and results in total (power grid) emissions of 14 lb of GHGs (CO_2e)

- Chevy Volt in gasoline / hybrid mode for 30 miles costs $3.21 and results in total emissions of 16 lb of GHGs (CO_2e)

- Toyota Prius in gasoline / hybrid mode for 30 miles costs $2.48 and results in total emissions of 12 lb of GHGs (CO_2e)

Noise Impacts

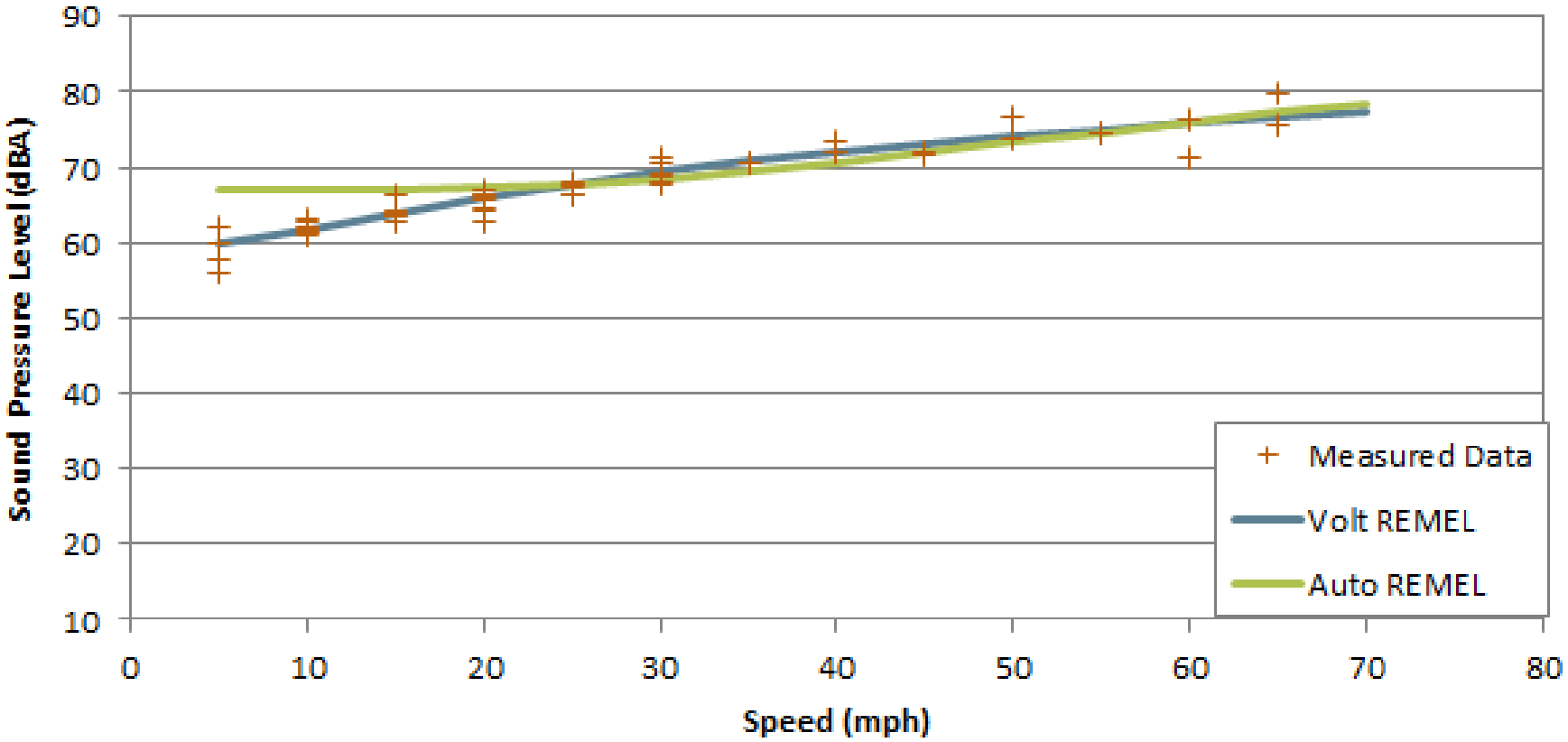
Cruise SPL by Speed



From Kaliski, et al, 2012

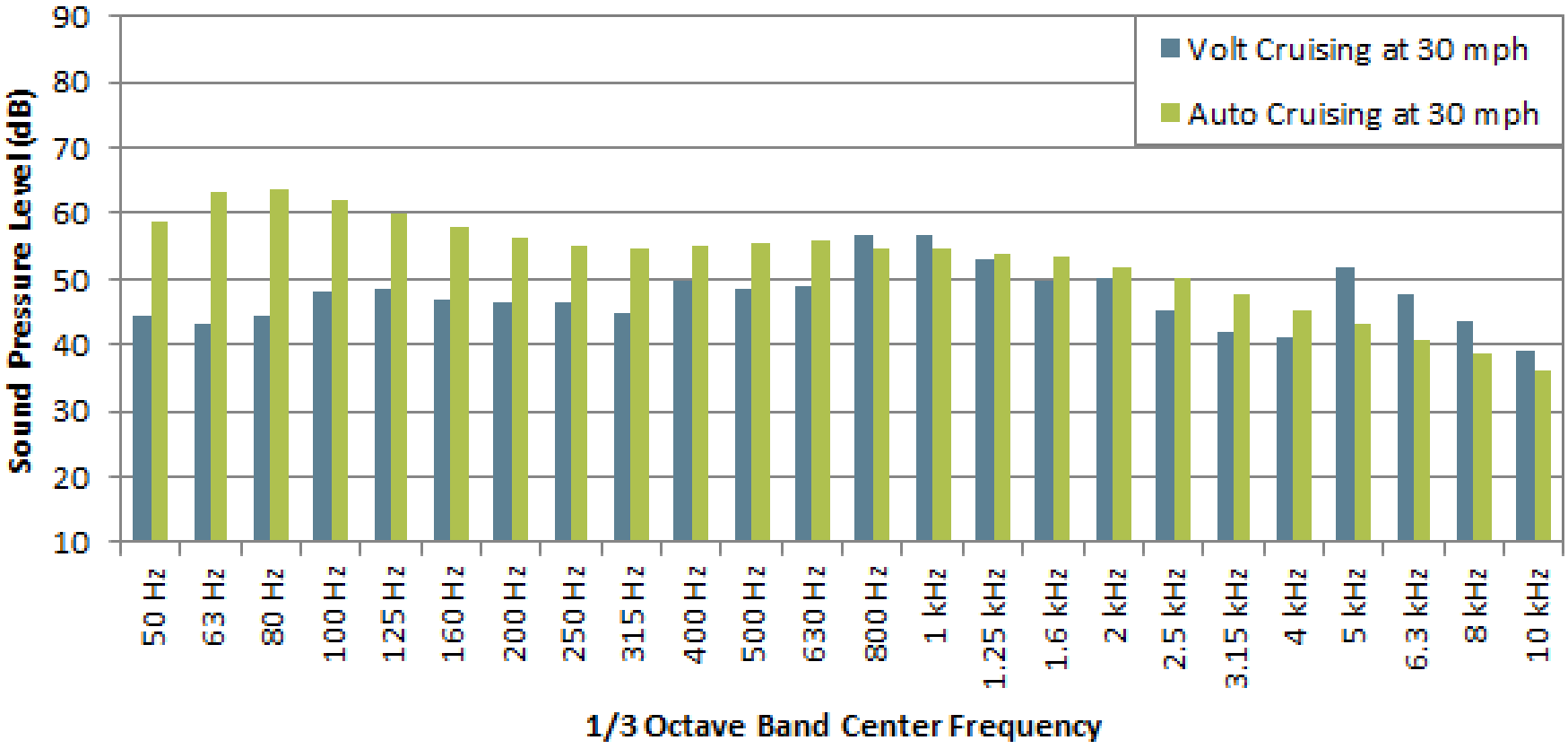
Noise impacts

Full throttle SPL vs speed



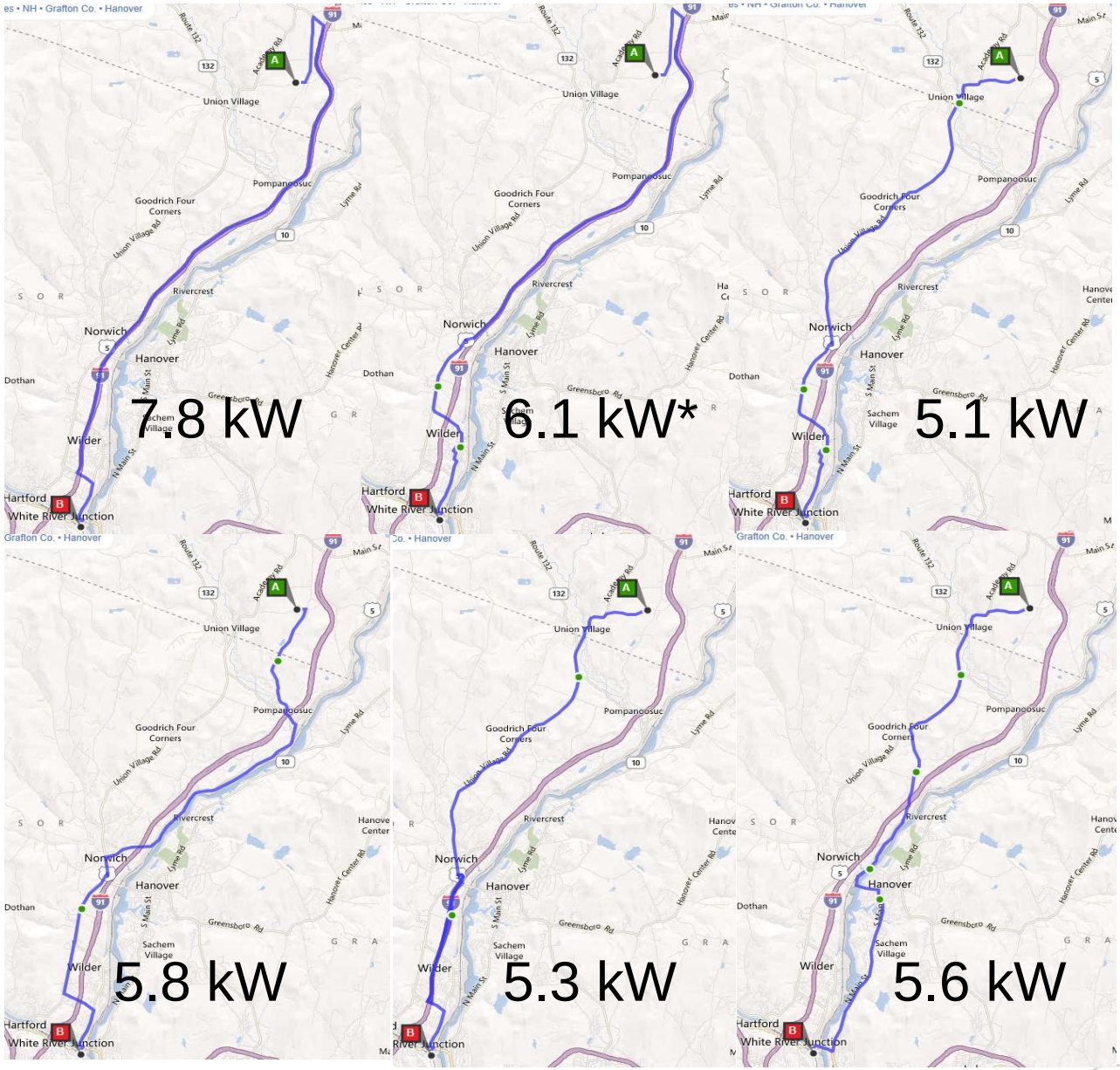
From Kaliski, et al, 2012

Cruise spectrum at 30 mph



Changing the way we drive

Optimizing routes to work



How municipalities and businesses can help

- Best help is at the workplace
- Not as much impact at retail businesses due to slow charging times
  - 4 hours @ 220 V - 10 miles of charging per hour
  - 10 hours at 115 V – 4 miles of charging per hour
- Reserved spaces and/or charging stations
- Programs for residential charging stations

Questions?

Ken Kaliski

Ken.kaliski@rsginc.com