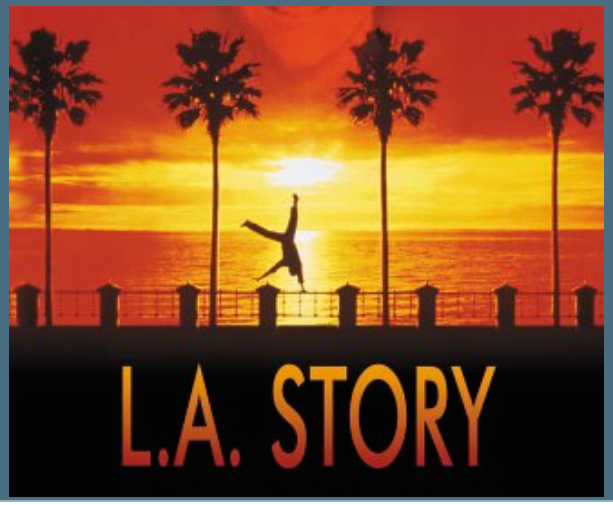
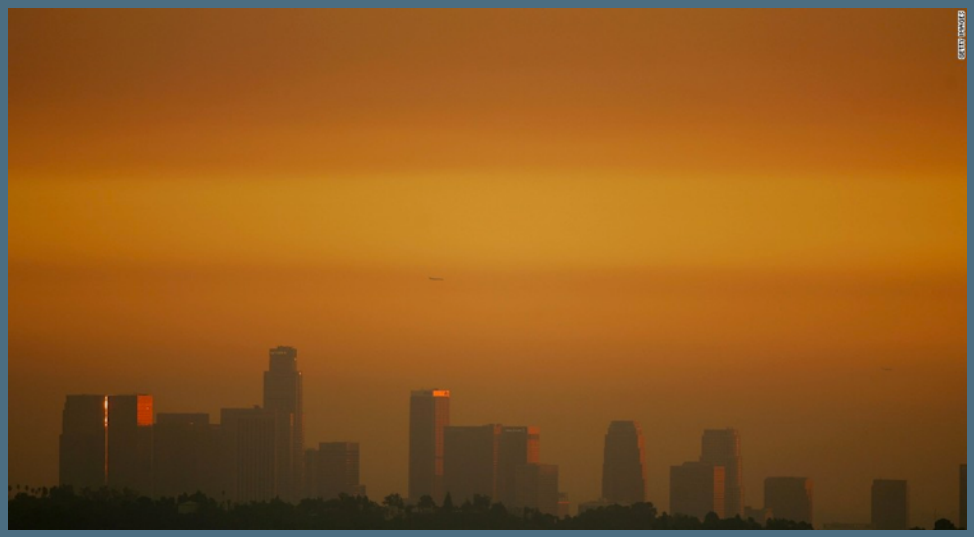
“L.A. Story”

How clean technologies and strict emission regulations have helped clean up the smoggiest region in the USA

John Drayton
January 2018



Background/History



Southland Under Smog Alert

HIGHLY TOXIC PESTICIDE

DBCP Still Used Despite Dangers

BY RONALD B. TAYLOR
Times Staff Writer

Much of the evidence was already in the widely used pesticide DBCP can make men sterile, create abnormal chromosomal patterns in human sperm, damage the testes of laboratory animals, cause stomach and mammary cancers in mice and rats.

Also, once injected into the soil by farm applicators, some of the chemical moves into underground water supplies and some, vaporized and becoming airborne, settles as carcinogenic residue on peaches, grapes, citrus fruits and vegetable crops commonly treated with DBCP.

Now, an informed source has told The Times, laboratory test results under review by the National Cancer Institute—if confirmed—will show that when rats inhale the same amounts of DBCP that workers have encountered in the manufacturing process, the rats develop unusually high numbers of malignant tumors.

"Those rats had tumors all the way up to their brains . . . We're going to have an outbreak of similar problems in workers, I'm pretty sure," one scientist said after seeing results of the study, which was conducted for the institute by Hazelton Toxicologi-

of thousands, chemical compounds that never before existed in nature are routinely created and used throughout the country; and, while many have unquestionable social and economic value, many also have a grim capacity for poisoning the environment and killing or crippling people.

Raising fundamental questions about the benefits of modern technology versus risks to human health and the environment, the story of DBCP also illustrates the lengths to which local, state, and federal officials sometime go in helping an industry

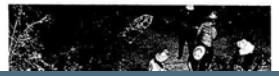
Please Turn to Page 24, Col. 1

Most Cases of Poisonings Go Unreported

BY RONALD B. TAYLOR
Times Staff Writer

CRASH VICTIMS—Nine children and two adults were injured as their station wagon plunged 50 feet off Little Tujunga Canyon Road in the Lakeview Terrace area when the driver apparently lost control of the vehicle. Some of the children are treated at the scene, top, while rescuers bring the driver up the cliff. The victims' identities were not immediately available.

Times photos by Mike Meadows



Israelis Report Downing Five

Will Affect 10% of Area Commuters

BY SANDRA BLAKESLEE
Times Staff Writer

Air pollution officials Wednesday predicted a second-stage smog episode today, a move that set into motion emergency smog abatement plans drawn up by 2,750 Southern California businesses.

Under the plans, companies with more than 100 employes in one location must reduce employe driving by 65% to 75%. Companies that emit pollutants into the air must reduce emissions by 20%. Utilities must burn low, polluting natural gas, if available.

The South Coast Air Quality Management District estimated that 10% of all commuters in Southern California would be affected by the plans, requiring thousands to car pool to work today.

Companies throughout the region notified employes Wednesday, using bulletin boards, public address systems and word of mouth that they would have to car pool or use public transportation today. Many firms have plans to cordon off parking lots, allowing only cars with three or more passengers to park.

It was the second time this year that pollution officials predicted, a day in advance, that smog levels would reach what is called a second-stage ozone level of .35 parts per million. At that level, many people notice a smell and feel eye irritation.

PALL OVER L.A.—Smog blanket hangs over downtown, dimming the setting sun. The bout of smog was called the worst here in 24 years.

Times photo by George Rose

Smog Siege Grips Area for 7th Day

Expected to Last Into the Weekend; Ailments Increase

BY RICHARD E. MEYER
Times Staff Writer

Eye-searing, throat-burning smog smothered the Los Angeles area in a bourbon-colored blanket Thursday, sending scores of persons to hospitals with respiratory trouble and forcing school children to stay indoors, out of the noxious air.

Meteorologists predicted that the yellow-brown bilge would wash over the Southland into the weekend. Doctors advised even healthy adults to stay indoors. The South Coast Air Quality Management District urged motorists to stay off the streets.

Too few did. The California Department of Transportation said traffic on Los Angeles freeways increased Thursday over the day before—by .005%.

The smog control district declared a Stage 2 alert for the seventh

WEATHER SHIFT OVER THE PACIFIC SEEN AS CAUSE

BY ROBERT GILLETTE
Times Science Writer

An unusual shift in summertime weather patterns over the northwestern Pacific appears to be the dominant cause of Los Angeles' worst siege of smog in more than two decades, meteorologists said Thursday.

Dr. Jerome Namias, a research meteorologist at UC San Diego, said that the persistent inversion layer—a blanket of warm air—that has trapped pollutants in the Los Angeles Basin for more than a week stems from a major westward shift of the Pacific high-pressure area that normally dominates summertime weather patterns over a vast area of the North Pacific and coastal United States.

The Pacific high is also significantly weaker than usual.

16 Smog Alerts Hit Southland; No Relief Seen

Background/History

1970's – Los Angeles named the first "Severe non-attainment region" for air quality by EPA.

1980's – Strict Air Quality Regulations Adopted for LA region

1992 – LA Metro adopts "Alternative Fuel" policy.

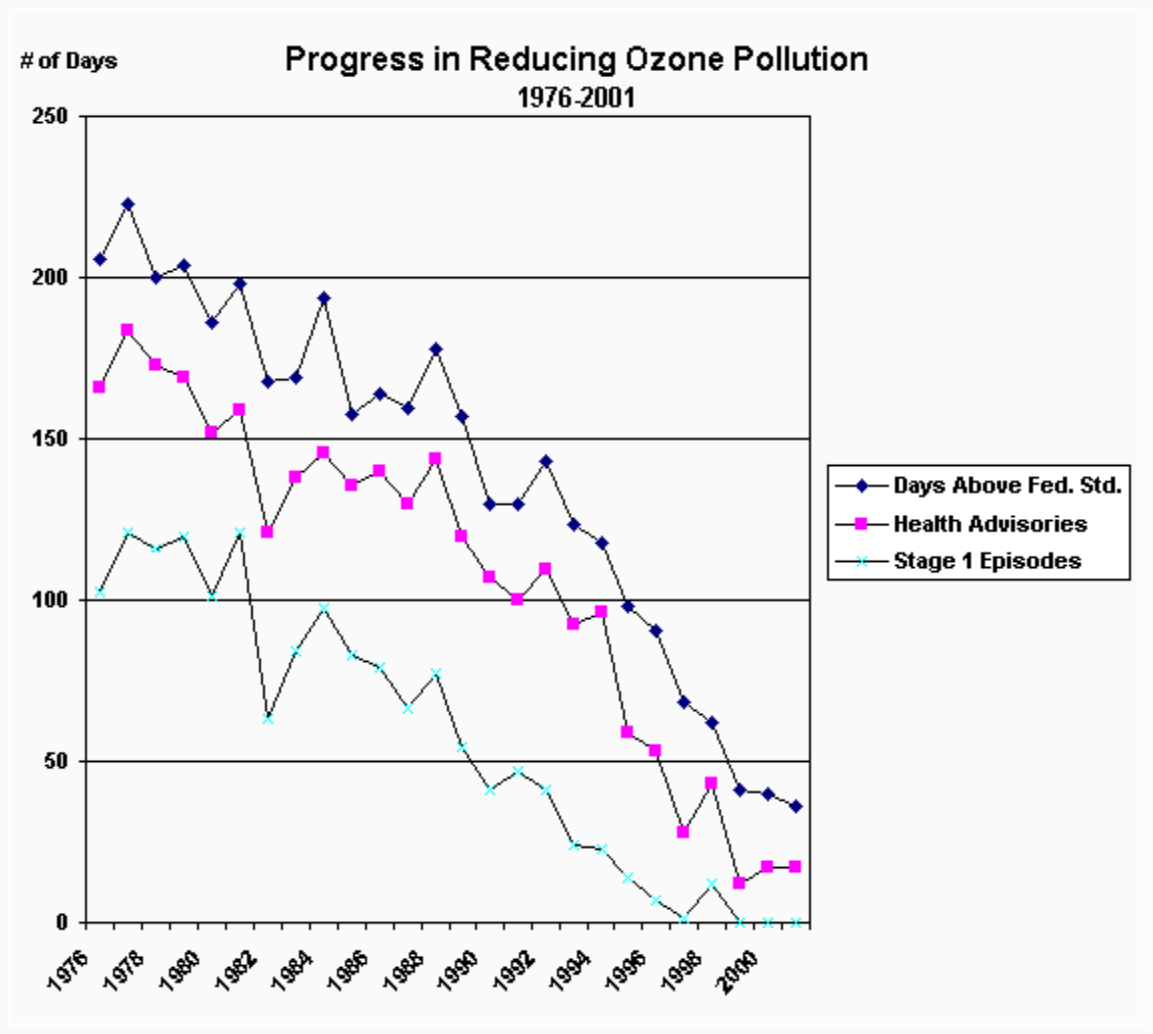
2000 – Metro commits to 100% CNG operation

2011 – Metro retires last diesel bus

2017 – Metro adopts goals for 100% RNG and Low NOx by 2024, and 100% ZEB by 2030.

2017 - Metro awards contracts for 105 ZE battery electric buses

Los Angeles Air Quality Improvements Since 1976

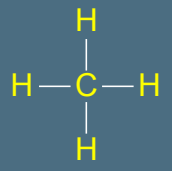


- **Zero** smog alerts in last four years
- Number of health advisories and days above Fed Standards have dropped by 75% - 90%!

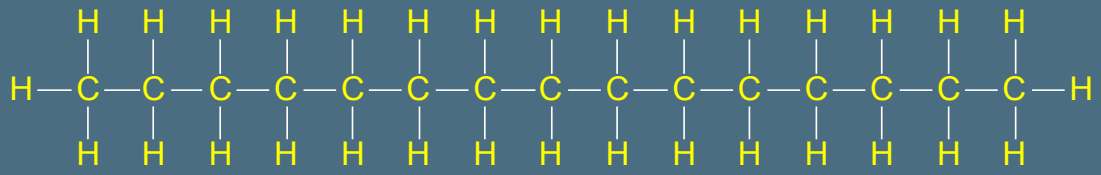
- **Regulation and technology can impact regional air quality**

Alternative Fuel Basics – What are Hydrocarbons?

Methane Gas
(CNG) CH_4



Diesel Fuel
$C_{15}H_{32}$



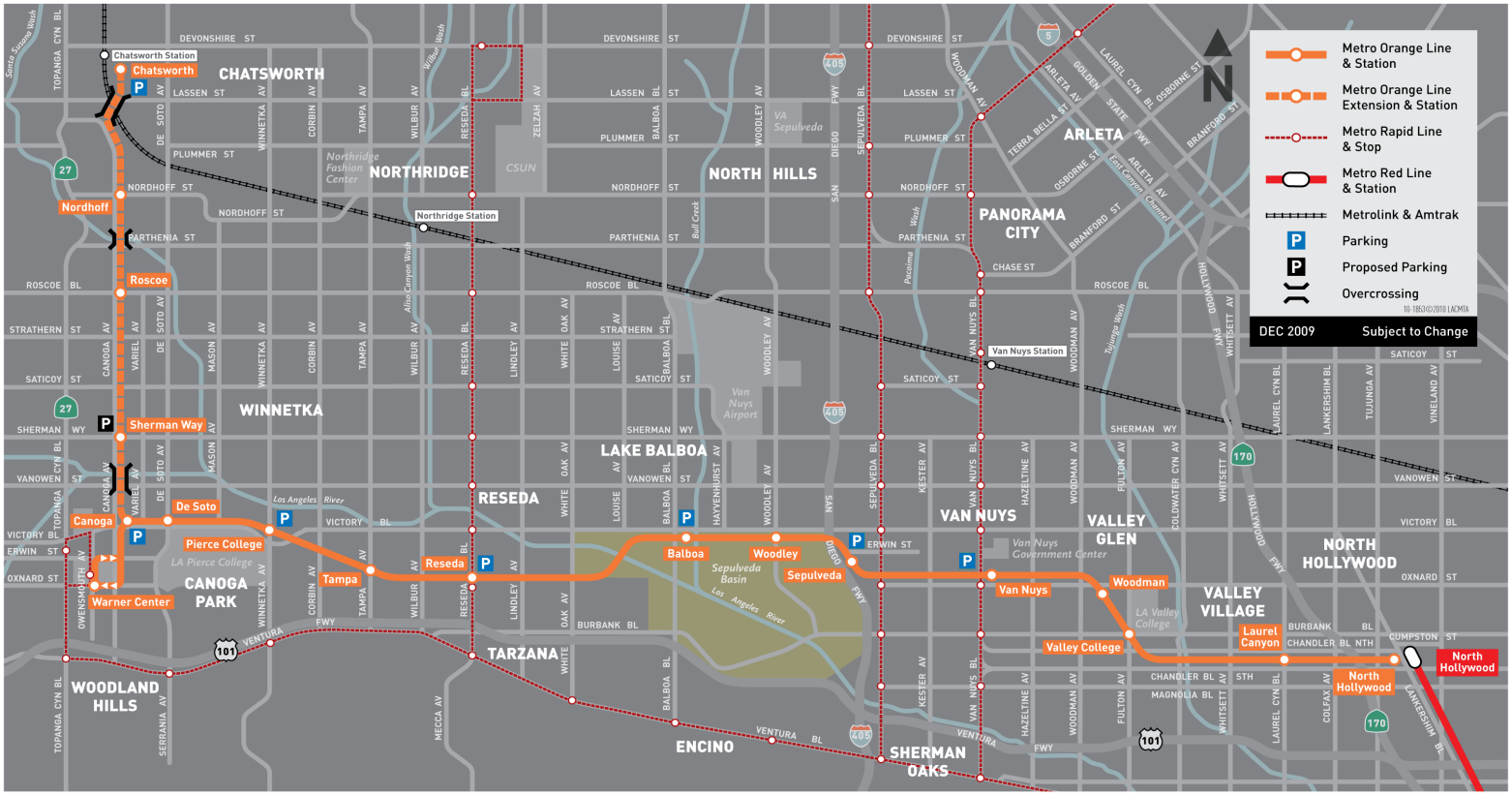
More Carbon = More Energy + More Emissions

Hydrogen:	H_2	High Fuel Cost, lowest emissions
Methane (CNG, LNG):	CH_4	Lower Fuel Cost, lower emissions
Gasoline:	C_6H_{14}	Higher Fuel Cost, higher emissions
Diesel:	$C_{15}H_{32;}$	Higher Fuel Cost, higher emissions
Coal:	$C_{240}H_{90}O_4NS$	Lowest Fuel Cost, highest Emissions
Electricity:	NA	Note - Primarily sourced from hydrocarbons.
RNG:	CH_4	Methane but from a renewable or bio source
GHG:	CO_2, CH_4 , Ozone	Methane has most severe emissions impacts

California Clean Air Incentive Programs

- LCFS and HVIP Programs
- California State Incentives for both ZE and Near ZE Technologies
- Increases taxes on conventional fossil fuels and carbon emissions to help offset costs for low/no emission alternatives
  - Example – LA Metro's contracts for RNG fuel cost 20-30% less than pipeline NG. Metro will transition to 100% RNG this year.
- State funding intended to recover any "Up charge," and to offset capital costs for more expensive but cleaner technologies and fuels

Metro Orange Line Map



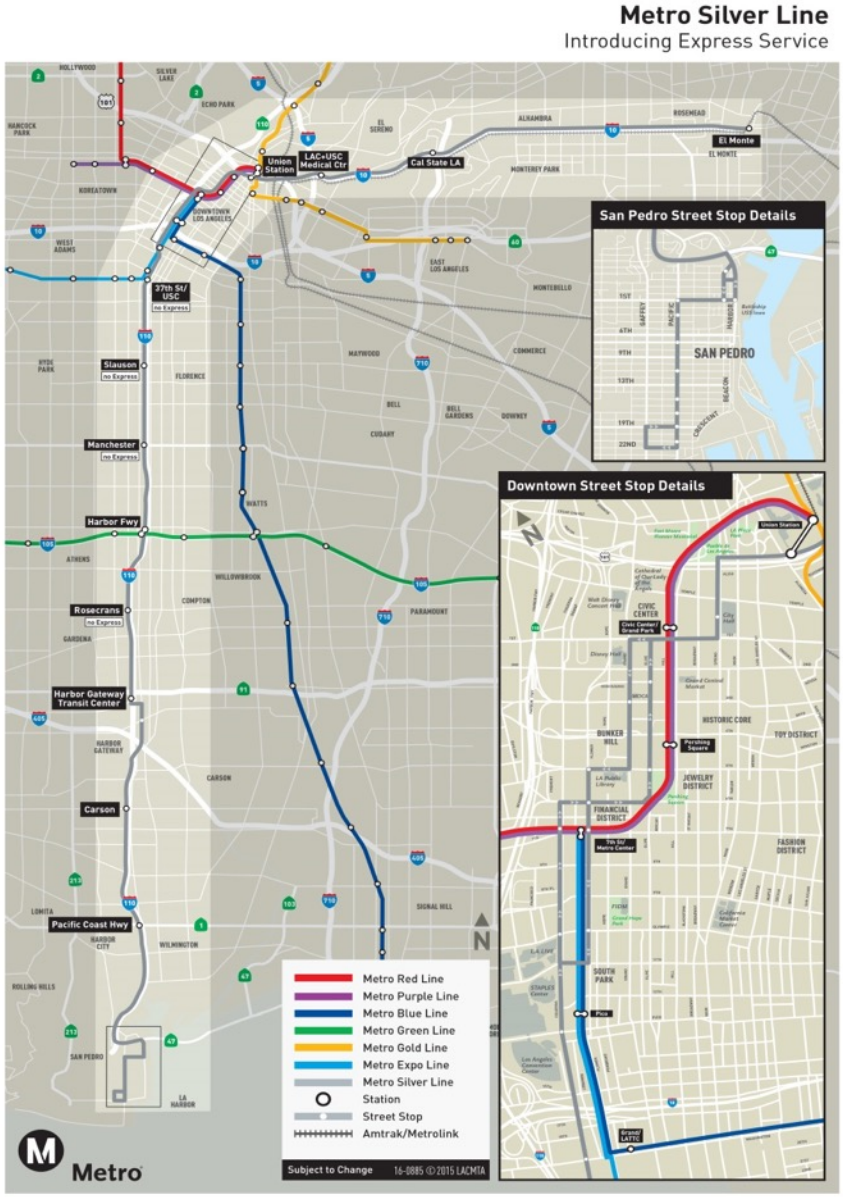
Metro

Metro ZEB Projects – Orange Line

- BRT line with 19 Miles of Dedicated ROW in San Fernando Valley
- 30,000 daily riders
- 4 Minute Headways
- Conversion to 100% ZEB operation by 2020
- 40 New Flyer articulated buses with 250Kwh batteries;
- 5 BYD buses with 590Kwh batteries.
- Siemens 450Kw Overhead Catenary Charging on ROW – continuous operation with 7-10 minutes charging per hour of operation during scheduled lay-overs.
- Effective but expensive technology option

Metro Silver Line ZEB Program

- 30 Mile Line running in HOV lanes on 10, 110 Fwys
- 60 BYD 40’ buses
- Buses will have 320Kwh of batteries; cost ~ $680,000/ bus.
- Charging infrastructure could end up being 20% of project cost
- Electricity rates and demand charges will be among the single biggest cost factors in both Metro ZE projects.
- BEB’s still emerging rapidly. For local services, we do not consider “BEB” electric buses to be commercially proven yet.



Notes about RNG and Low NOx Engines

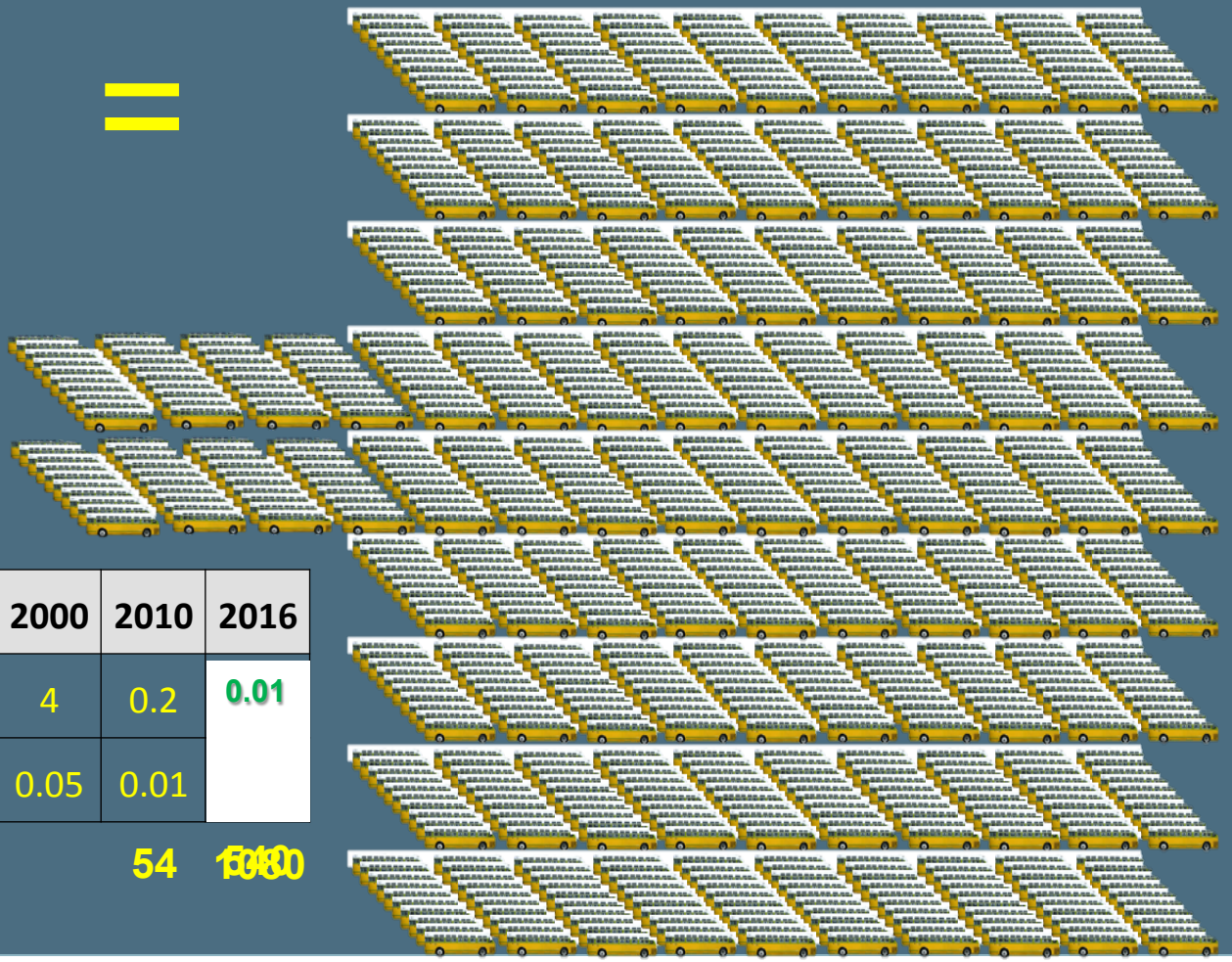
- LA Metro will be 100% RNG/Low NOx by 2024
- Using RNG/Low NOx, LA Metro will realize 99% of the AQ benefits of their longer term transition to ZEB, and in half the time.
- The Cummins-Westport Near Zero NG engine is certified at 99% cleaner than current 2010 EPA standard for NOx. During testing at UCR, no NOx emissions detected (0.00!)
- By using RNG, operators can also reduce 80% of GHG emissions.
- Proven technology (no technology risk).
- Maximizes Metro's emissions reduction 2018-2024
- 60% of CA's GHG/CH_4 emissions is from agriculture (dairy), and recoverable as RNG. In some cases, recapturing RNG can have a negative carbon intensity. (Can RNG be "Less than Zero?" – YES!!!)
- Potential for RNG – <u>if you have access to RNG, find a way to use it!</u>

Emission Reductions Since 1990's

1990 RTS-II Bus

=

1000+ Low NOx CNG Engines



	1985	1990	1991	2000	2010	2016
NOx (g/hp-hr)	10.8	6	5	4	0.2	0.01
PM (g/hp)	0.59	0.59	0.25	0.05	0.01	

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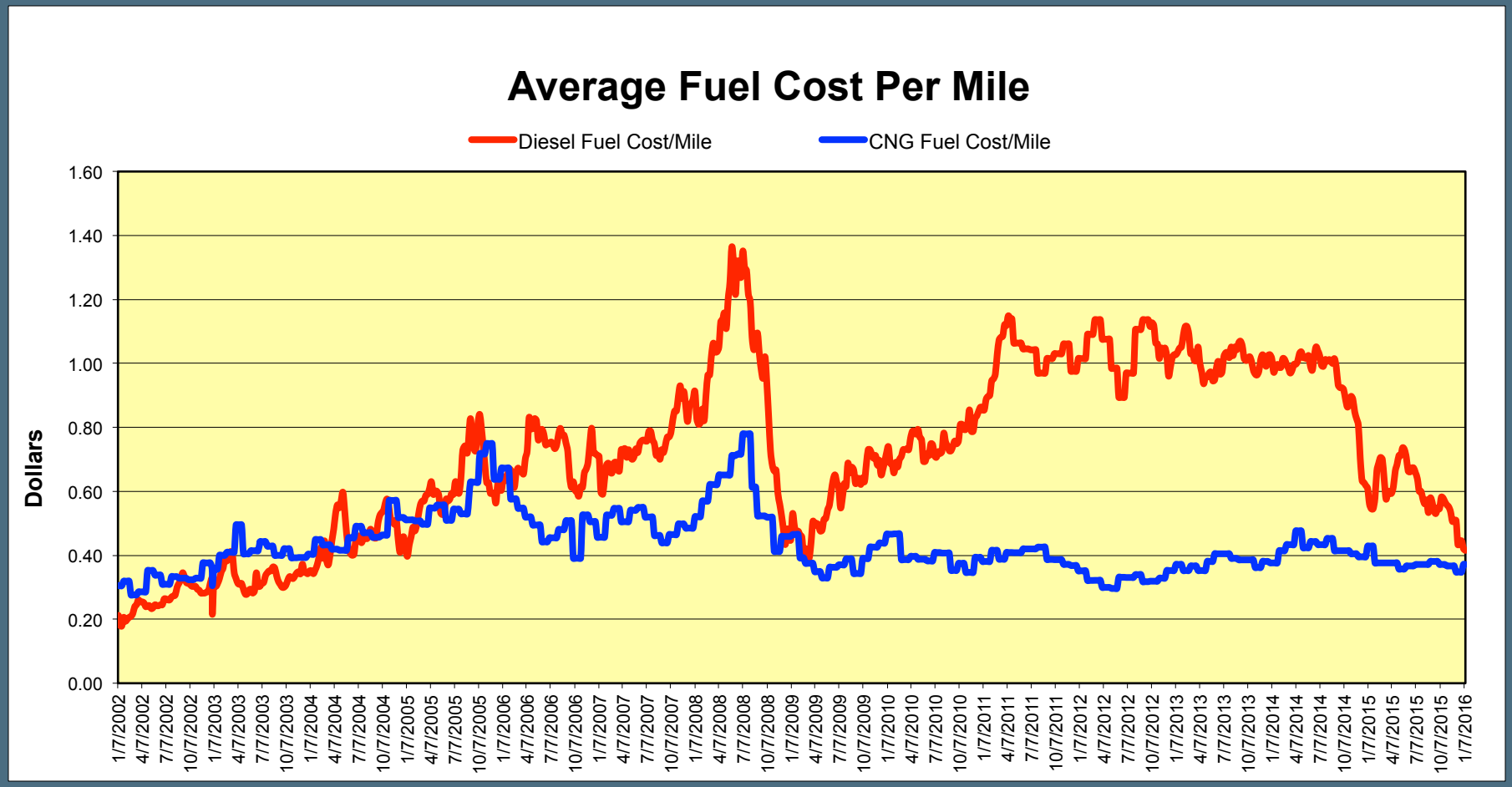
Comparison of Metro CNG and Diesel Fuel Prices 2002-2016
(cost/mile)



LA Metro has saved about $500 million in fuel costs with its CNG Program

Summary

- Technology and regulation can have a big impact on regional air quality
- There are many factors that affect what combination of technologies make the most operational sense for a given duty cycle
- We should be making the use of every tool in our tool box to help reduce emissions and improve air quality in our regions


On Behalf of Los Angeles…
Thank You
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