



USA 2034: A Look Back at the 25th Anniversary Year

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This is a guest vision by friend of The Oil Drum, Alan S. Drake.

After an extended period of bewildering, painful and rewarding transition, the people of the USA finally feel that they have found their feet underneath them, with a clear and hopeful path to the future. Oil consumption is down to 6.6 million barrels/day, 30% of our 2007 peak oil use, and CO₂ emissions are 26% of their 2011 peak, a matter of pride for most Americans.

Rapid reductions in world carbon emissions (almost as great as US reductions), plus some negative feedback loops, have kept Global Warming effects manageable. Persistent and prolonged droughts in the American Southwest have been the largest effect so far in the USA.

At long last the goal of “Not One Drop” of oil is being burned to transport people and freight over the nations railroads. All of the main and secondary lines are electrified with battery locomotives for some short spurs.

A nationwide system of grade separated main lines are complete with new extensions being added every year. Two tracks for heavy freight moving at 50 to 70 mph and one or two tracks (three in California and the Northeast) for passengers and light & medium density freight moving at maximum speeds of 110 to 125 mph. The 2005 CSX proposal for Washington DC to Miami became a template for the nation. There is growing demand for true high speed rail and politicians are searching for funding.

All interstate highways are heavily tolled and reduced to no more than 4 lanes (a few urban 6 and even 8 lanes survive) with some down to one travel lane in each direction with a wide and unmaintained shoulder. Heavy trucking is reduced to shuttling containers from the nearest railhead to those remaining warehouses and factories not directly served by rail, plus a few specialty roles such as delivering wind turbines to remote rural locations.

Boeing 797s (successor to 737 using 787 technology) rule the skies, with different models providing 130 to 210 seats on direct flights between major rail centers at fuel saving cruise speeds of 400 to 450 mph. The new paradigm for cross-country travel is to take rail to the regional hub airport, catch one of the 1 to 3 direct daily flights to another hub airport and rail to the final destination. Regional passenger rail dominates inter-city trips up to 250 miles and becomes a minor mode for trips much over 600 miles. Overall travel volumes have declined dramatically due to increasing costs and reduced economic activity.

Barge traffic picked up significantly twenty years ago, with container barge trains stopping daily (one up stream bound, the other downstream bound) at every major river port. Ever higher oil

prices, have made electrified railroads more competitive and they have taken market share from the barges in recent years. Tugs are experimenting with coal emulsion fuel as a counter measure.

The North American electrical grid failed in it's goal of 90% non-GHG generation due to a hotter than expected summer, but 89.7% is still a major step forward ! Wind turbines supplied nearly half the total MWh, and nuclear power over a quarter. For the first time the USA completed six nuclear reactors this year (with one each in Canada and Mexico as well). The new large Canadian hydro projects are pretty well complete and the microhydro saturation in USA is well over half completed. Several percent come from solar thermal in the desert Southwest (USA & Mexico) and solar photovoltaic is now growing exponentially, reminding many of the earlier "Rush to Wind".

A growing grid of HV DC lines (3 to 10 GW capacity each) connect wind turbines from the Wind Export Belt to both pumped storage and demand centers in redundant triangles. The first such triangle connected western Oklahoma, pumped storage near Chattanooga Tennessee and Orlando Florida (with a spur to Miami). A short spur from Chattanooga to near Birmingham Alabama created more parallel paths and added Alabama to the new HV DC grid. Other HV DC triangles connect Southern California to Wyoming and Montana (started in 2006) with pumped storage in the Rockies and North Dakota/Manitoba with the Upper Peninsula of Michigan and Chicago. And thirty more such triangles exist..

Occasionally fossil fuels (coal and natural gas) are burned to generate electricity during a cold winter spell, but coal fired plants are routinely fired for months each summer to meet the still large air conditioner demand. Debate over how to turn these power plants off still rages.

Some point to the success of the conversion from oil heat to ground loop (geothermal) heat pumps and suggest this is a worthwhile path to reduce residual residential natural gas demand and to create more efficient air conditioning.

Others point to the success of implementing German standards for insulation and energy efficiency for new construction (R-49 walls etc for most of the nation) and suggest accelerated scrapping of inaccessible housing (with the well known other energy savings and carbon capture that go with converting Suburbia back to orchards) and further expanding TOD housing, both in Urban and Suburban commuter rail nodes. They criticize the money wasted on retrofitting insulation into Exurban McMansions that were later abandoned, while others think the Great Retreat from Suburbia has run it's course and we should focus more on retrofitting older construction and less on new. All sides agree with strengthening the insulation and energy efficiency upgrades required before rental housing can be sold.

There is also a raging debate between solar, wind and nuclear supporters on how best to eliminate the summer coal burning. Wind proponents point to their lower cost of production/MWh and that new nukes will require just as much pumped storage as would new wind, They also mention the Bellefonte Incident.

Nuke supporters say that several times each year we have a surplus of wind already (all pumped storage full, nuke production stepped down and still power goes to waste) and fewer than 100 people died in the Bellefonte Incident. Wind turbine maintenance kills a dozen every year. Wind production drops in the summer and there is no practical way to store large amounts of power from spring into summer unless the Great Lakes Scheme is implemented. And even holding back the spring waters in the Great Lakes till summer would not be enough.

Solar proponents argue that solar output peaks at noon on summer solstice, and has not

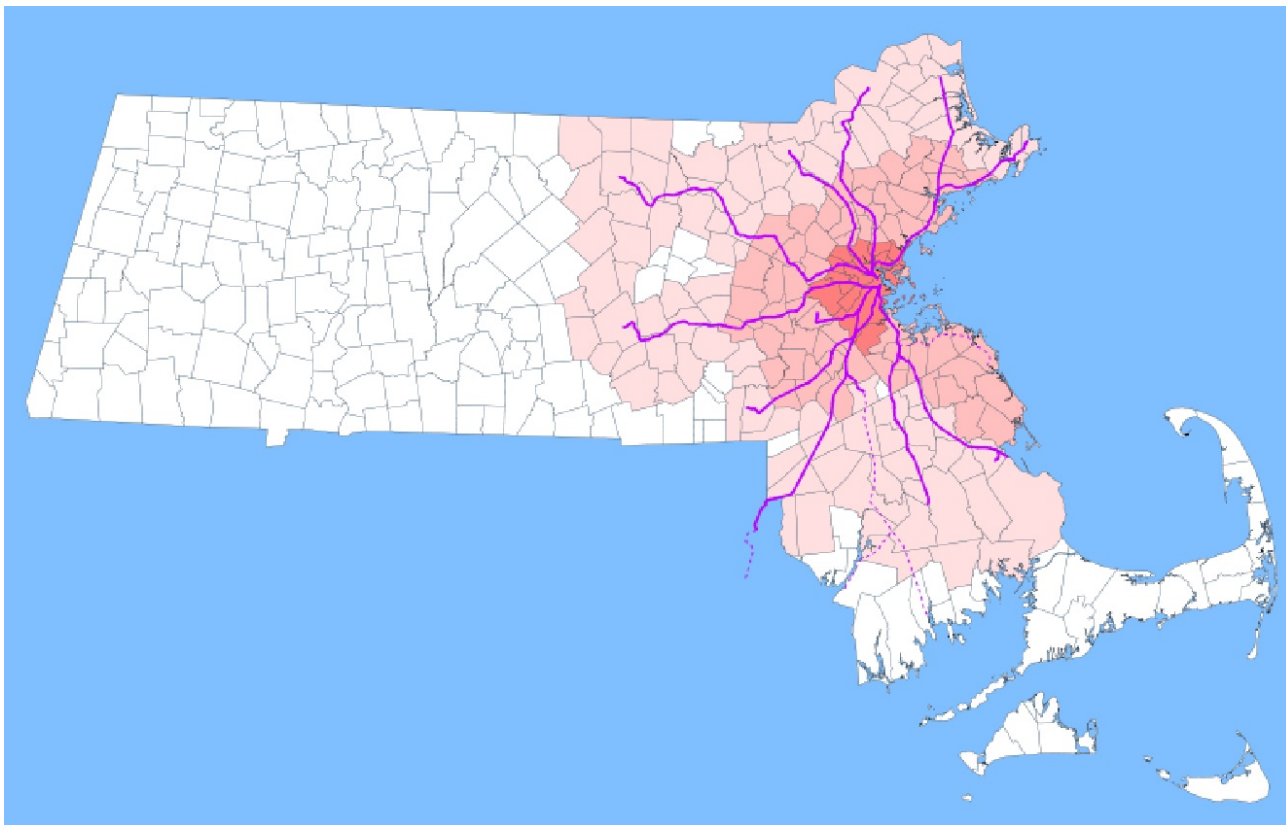
significantly declined by mid-afternoon in late summer when coal burning reaches a maximum. Solar is underrepresented in the national grid and more solar will help the grid.

And many Greens just want higher in-door temperatures and less air conditioning till the last coal fired plant is mothballed !

Arlington Texas is now the last American town over 100,000 without electrified public transportation (just as it was the only town without public buses 25 years ago). Needless to say Arlington is a dangerous, bankrupt slum and will soon slip below 100,000 population (at least those willing to be counted). The Texas Rangers moved from their Arlington stadium to a light rail hub over a decade ago so that fans could get to games.

Elsewhere, an array of subways and elevated rapid Rail, plus Light Rail, Streetcars and electric trolley buses supply the majority of urban Vehicles Miles Traveled and commuter trains keep the remaining suburban townships going. At night trolley freight uses the tracks to distribute food and goods. Most towns of 60,000 and more have some form of electrified transit today.

Boston was a historic example of a comprehensive commuter rail network that can support walkable suburbia clustered around rail stations. Today, dozens of cities now emulate Boston and almost a fifth of the population lives in Transit Suburbia as it is now called.



Polls from the turn of the century showed that 30% of Americans wanted to live in Transit Orientated Development but fewer than 2% could because of the lack thereof. Today, in a reverse of the White Flight to Suburbia from 1950 to 1970, almost exactly one third of the population lives in TOD and another quarter want to as part of the Great Retreat from Suburbia.

Electric assisted tricycles have become the icon of aging baby boomers, and the constant butt of jokes on late night TV talk shows. They are the ULTIMATE un-cool means of transportation and NO self-respecting teenager would EVER be caught on one !

The “in ride” is a recumbent bicycle with an oversized rear tire and fairings painted in iridescent (or black) paint, preferably with a matching single wheel trailer for “stuff”.

Early in the Post-Peak Oil Era, many turned to gasoline powered scooters and small motorcycles, but first public policy and then economics turned against them when it was realized that 100 mpg was not good enough (and accidents mounted). Instead electric assist bicycles were encouraged and many two ways streets were turned into one way streets with the other lane becoming a two way bike lane. Segways also developed a loyal following.

In the early years Post-Peak Oil, Neighborhood Electric Vehicles (such as the classic <http://www.gemcar.com> The New Model T) and Bicycles contested for modal share with the out-of-shape and obese strongly favoring NEVs at first. Cultural values and parking fees lead to today’s dominance by bicycles but NEVs still occupy a large niche.

Plug-in Hybrids and small diesels also had a contest for modal share. Farmers and other rural residents tend towards small diesels, many of whom make their own (or buy a neighbors) small scale bio-diesel. Surviving Suburbanites tend towards PHEVs, which typically get 100 to 130 mpg today.

However, since the cost of maintaining the remaining roads (asphalt is just very heavy oil that can be upgraded to fuel) has escalated dramatically and public policy has placed the full cost of all city streets and rural roads on privately owned cars and trucks (most heavily on those that use oil) and removed it from property taxes (bicycles get a free ride), the inflation adjusted cost of operating a 100 mph PHEV or small diesel is several times that of operating a Hummer in 2009. Given the economic decline Post-Peak Oil, driving a full size car is reserved for the well-to-do and is occasionally meet with hostility, especially towards those that drive oil burners and not straight EVs.

Most Post-Peak Oil Suburbia descended into a spiral that duplicated the post-WW II decline of central cities and downtowns. Mortgage defaults started the decline, with empty houses first depressing the market, followed by declining public services, poorer schools and changing population demographics and ever rising oil prices past all expectations.

The revocation of prohibitions against “red lining” (to reduce massive mortgage losses) brought back the same post-WW II effects that central cities once experienced. Willing buyers had trouble financing Suburban housing due to their perpetually declining values and massive overhang of unsold properties.

Recent academic studies have shown that once a subdivision stayed below 42% occupancy for over a year, there would be no recovery. Occupancy rates quickly plunged in “Suburban Flight” after this tipping point. After that, experience has taught us that salvaging the empty homes for materials and planting the land with orchard crops was usually the optimum choice.

Housing square feet/capita has more than doubled in the 60 years prior to Peak Oil, and declined that much and more in the last 25 years. Retail space had expanded by an order of magnitude and underwent a similar decline. The prolonged economic depression due to persistent and ever growing oil shortfalls resulted in much more compressed populations relying on primarily non-oil transportation. Even 100 mpg scooters cost too much for most people. Walking, bicycling (electric assist for the better off), electrified rail, mainly small electrical vehicles for the upper class, and even the occasional horse or a donkey with cart.

“The Energy Solution” first put forward in 2008 included housing as part of the transportation

fuels solution. Reduced natural gas use for water heating (tankless gas hot water heaters, heat pump water heaters and solar water heaters), space heating (much better insulation & windows, ground loop heat pumps) and electrical generation (wind turbines, solar PV & thermal, nuclear power plants and pumped storage) released natural gas and propane/butane for use as specialty transportation fuels despite the declining supply of natural gas. Conservation exceeded natural gas depletion in a mad rush !

As we all know, the first decade post-Peak Oil was quite difficult. History calls it the “Bad Tens” for good reason. Suicides peaked at 8 times pre-Peak levels for a decade post-Peak and are now down to just twice pre-Peak levels. Demographics shifted significantly, as they did when the Soviet Union collapsed. Life expectancy declined almost a decade in the USA, but it was more gender balanced than in Russia.

Overall mortality increased dramatically in the Bad Tens, just as it did a few years earlier in post-Katrina New Orleans. The long term effects of obesity and diabetes combined with chaotic healthcare for most citizens and simple despair and disorientation resulted in a 50% increase in the death rate for those ten years. Healthcare reforms and a radical change in lifestyle and diet have turned this downward slide around and life expectancy today is now just 1.7 years less than it was in 2007 !

Birth rates fell dramatically in the Bad Tens and have crept ever lower year by year since then, and this year saw the first small increase in fertility to 1.21 children/woman.

A massive expulsion of non-citizens (both legal and illegal) followed the 2016 election. Many American living abroad were forced home as a result but the USA was left with 15 million fewer consumers, significant social issues and a still raging debate.

Much has been lost in the last quarter century, but few regret the loss of every greater extremes of consumer excess. The use of the word “consumer” is now considered a pejorative and an insult to one’s values. “Citizen” is a title of pride again, with an implied understanding of duties and obligations that go with that title.

And much has been gained. Social isolation shrank with Suburbia and the economy. Many found compassion and caring for their fellow humanity within themselves in the Bad Tens. People think, and talk and plan, of the “generations to come” and the New America.

As we close this year of 2034, for the first time in a quarter century, we can now say that next year looks to be better than this last year. Our problems are not solved, but we know the solution and we are confident of our ability to work and sweat towards sustainable, workable solutions !

Best Hopes for the Future,
Alan Drake

The above was not written as a work of fiction, but as an aid to the modelers at the Millennium Institute. A “word picture” to supplement the dry statistics.

The results of “Alan Drake’s Vision” are much more positive than any other scenario that they have run on their T21 model. Ever.

This work was also presented at the Houston ASPO-USA conference.



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