



Electrified Rail: An Overlooked Mitigation Strategy for Peak Oil?

Posted by [Robert Rapier](#) on October 20, 2006 - 9:19am

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This a guest post by [Alan Drake](#).

Roger Bezdek is one of the co-authors of the "Hirsch" reports, AFAIK the only official US Government analysis of what to do about Peak Oil. Below is a link to an interview with Dr. Bezdek with links to his two reports.

<http://www.globalpublicmedia.com/interviews/713>

I have reservations about the proposed mitigation strategies (~\$5 trillion for coal-to-liquids, oil shale, enhanced oil recovery and better vehicle efficiency) and believe that he has overlooked mitigation via electrified rail.

I sent him the following email without response.

Dear Mr. Hirsch, Dr. Bezdek and Mr. Wendling:

I believe that your two reports for the Department of Energy on Peak Oil overlooked the best single option in dealing with this problem. I have attached two related papers of my own for your review and comment before spreading them more widely.

The best solution, in my opinion, is for you to simply incorporate them into your suggested mitigation strategies as an addendum and I would be willing to co-operate fully in that. However, I will try to promote this option as public policy in any case.

Best Hopes,

Alan Drake

Dr. Bezdek will be a speaker at the ASPO conference in Boston (I will be moderating a Saturday after conference workshop). In that context, I sent him the following eMail. It summarizes in advocacy form my basic policy for dealing with Peak Oil.

Dear Dr. Bezdek:

The short version of my position is that the best Peak Oil mitigation options are two related steps that we can take. They may, or may not be enough, but they are the best and first steps that we should take.

One - Electrify our freight railroads and replace the double and triple tracks taken up in recent decades. (Double track has ~x4 the capacity of single track). See EU & Japan. Russia finished electrifying the Trans-Siberian in 2002 and finished to Murmansk on the Arctic Ocean last Christmas Eve. There are no technical obstacles to electrification or higher general freight capacity that cannot be resolved in one decade.

Two simple public policy steps are required IMO to implement. Any railroad that electrifies is exempt from property taxes (also encourages track improvements to meet demand) and putting tolls on Interstate highways (as Eisenhower originally wanted to do). Accelerated depreciation is always good.

In twenty years, over 2 million barrels/day of refined diesel could be saved in a Peak Oil environment.

Two - Build Urban Rail on an urgent basis. Start on ~\$120 billion in plans (some active, some dusty) within one to three years. As the first wave is under construction, design a second larger wave and a still larger third wave, all completed within 20 years.

The United States built subways in the larger cities and streetcar lines in 500 cities and towns (as small as 18,000) from 1897 to 1916. The US had about 90 million people, 3% of today's GNP and primitive technology (coal, mules and sweat). Can we do one fourth as much today with x30 the GNP and modern technology ?

Public policies were successful in transforming our urban form from 1950 to 1970. Virtually every downtown was abandoned and most pre-WW II housing was "trashed". We can transform our urban form in twenty years, that is a demonstrated historical fact.

Public Policy ? 90% federal funding (same as Interstate Highways) and reduced bureaucracy. I prefer a two path approach (federal process & get 90% funding up front OR build it locally and get results based funding ex post facto).

Oil saved ? DC Metro saves 1/2 to 1 billion gallons/year, directly and indirectly. Multiple x50 over twenty years with an urgent, but not crash effort. Peak Oil will push Transit Orientated Development more than VA loans and highways pushed "white flight" decades ago.

Two and a half - Promote electric trolley buses. Public Policy: FTA funding at 92% for electric trolley buses, 75% for fossil fuel buses.

Promote transportation bicycling. Make it patriotic to use less energy, especially oil.

Electric motors are much more efficient than internal combustion and rail is much more efficient than rubber tires. Shifting freight from heavy trucks to electrified railroads replaces 20 BTUs of diesel with 1 electricity BTU. Most recent data is that 0.17% of US electricity is used for transportation (including 8,000 subway cars of NYC). The electricity needed for the steps above can easily come from either conservation or new

wind installations.

Unlike CTL, oil shale and EOR, my proposals have positive feedback with Peak Oil. The worse things get, the more oil they "produce".

Peak Oil will be a large and brutal hammer. People and industry will flock to the shelter of non-oil transportation IF IT EXISTS! Otherwise, they will just be beaten down.

I have more (a semi-high speed passenger and freight rail network, geothermal heat pumps & solar water heating to replace oil & NG, compressed NG for specialty transportation, bio sources of monomers, Strategic Rail Reserve to supplement the SPR, nationwide HV DC electricity grid) beyond these basic steps.

BTW, my favorite example is Switzerland 1945. A western industrialized democracy maintained a decent quality of life with 1/400th of US oil use/capita. Electric transport, bicycles and shoe leather maintained society and the economy.

Three years later, oil demand exploded by a factor of 30. If the US used as much/capita, we could join OPEC as the #3 or #4 oil exporter.

Switzerland today (since 2000) is working on a 31 billion Swiss franc program to replace heavy trucks with (hydro) electric rail. Adjust for population and currency and it is equivalent to the US spending \$1 trillion over 20 years improving our railroads.

Best Hopes,

Alan Drake

I also sent this follow-up eMail, where he pointed out that a rail line to Dulles had not been built.

Dear Roger,

It is a matter of priorities and finances. I am familiar with the Tyson's Corner-Dulles extension (and the Purple Line to the north, and the 40 miles of streetcars that DC wants to build. I have helped DC DOT with their streetcar plans).

The TC-Dulles line did not make the cut for the first 103 miles of Washington Metro. There is an unwritten rule at FTA, "one line at a time". So DC Metro could not get serious until they finished the Green Line and the first 3 mile extension beyond the original plan.

The Bush Administration effectively cut federal matching from 80% to 50% AND tightened criteria in response to a growing demand for more Urban Rail. This "raised the bar" but the need for the TC-Dulles line increased as well. The FTA also slowed disbursements by increasing study requirements, etc. Rationing by queue.

It is my understanding that the first half, to Tyson's Corner, is in detailed engineering design. The first attempt, using a subway in Tyson's Corner came in too high to meet current criteria, so they are looking at corners to cut. Elevated rather than subway is being considered, despite operational issues that this will cause.

Grant 90% federal funding and ground will be broken on TC-Dulles within 18 months.

The slowness you see is the deliberate result of federal decisions. OTOH, the French (who are building a tram line in every city of 250,000 that "votes correctly") are renowned for the quickness of their study, design and approval process. This from a nation well known for endless bureaucracy! But they see strategic value of these tram lines and react accordingly (as they did with nuclear power).

I admit that no endangered species reports were required in 1903 before NYC subways could be built, but there is fundamentally no good reason that the process should take more than 6 months longer today than it did 100 years ago to design and build a subway or surface rail line. We have computers, not slide rules and paper, a century of experience, and modern technology, not just "coal, mules and sweat".

I can forward more information and I look forward to discussions with you. I am arriving a day early at Buckminster Hotel and staying two days late for sight seeing. If your schedule allows this might be an ideal time to meet.

Best Hopes,

Alan

Attached is a personal list of Urban Rail projects with existing design work and route selection already done. I am sure that I have missed some. Depending upon the depth of dust, etc. on these plans, almost all could be under construction within 1 to 3 years if it were a national priority. Simply giving 90% federal funding would be all that would be required in most cases

The following list was composed by Lyndon Henry and the author from memory and likely overlooks some projects. The degree of engineering on file for each project varies significantly, and much of the information is dated. However, all of the projects noted below could start construction in one to three years if it was an urgent national priority.

A rough guess is that the projects below would cost roughly \$125 billion to complete.

Albuquerque - Light Rail and Commuter Rail plans

Atlanta - Beltway Light Rail, Northern suburbs Light Rail extension, downtown streetcar

Austin - Two Light Rail Lines plus Commuter rail and downtown streetcars

Baltimore - East-West Light Rail Line, 4 mile extension to current subway

Birmingham AL - Streetcar lines

Boston - All rail plans promised as environmental offset to "Big Dig"

Buffalo - Planned extensions to current light rail subway

Charlotte - All plans currently scheduled

Chicago - Expansions to Metra, South Shore Line

Cincinnati - Light Rail plans voted down

Columbus OH - Light Rail and streetcar lines

Corpus Christi TX - Streetcar line

Dallas - All plans through 2015 and all 2015-2030 options (roughly 145 mile system)

Dayton OH - Streetcar plans

Denver - 117 miles of Light Rail and Commuter Rail (already locally funded)

Ft. Lauderdale - Light Rail and streetcar plans under active development
Honolulu - Line currently under development
Houston - All plans voted for, 65 new miles light rail 8 miles commuter
Indianapolis - Light Rail Line plans
Kansas City - Light Rail Line proposed
Las Vegas - Light Rail plans
Little Rock - Short extensions of existing streetcar line, Light Rail line
Los Angeles - Red Line "Subway to the Sea", Vermont Avenue subway, XX miles of Light Rail, electric trolley bus plan, electrify commuter rail
Louisville KY - Light Rail line plans
Madison WS - Streetcar and Commuter Rail plans
Memphis - At least two Light Lines in comprehensive plan
Miami - 103 miles of elevated Rapid Rail (subway type) + Miami Beach streetcar (already locally funded) 90% of the population would be within 3 miles of a station and half within 2 miles of a station
Minneapolis-St. Paul - Central Light Rail connector between the cities
Missoula MN - Commuter Rail
Nashville - Commuter Rail in process
New Orleans - Desire Streetcar Line, Riverfront Streetcar Line extensions
New York City - 2nd Avenue Subway, 3rd Tunnel under Hudson, Penn to Grand Central connection, Staten Island Light Rail, New Jersey Light Rail extension, commuter rail improvements
Ogden UT - Streetcar plans
Orange County CA - Center Line Light Rail plan voted down
Orlando - Light Rail plan voted down
Phoenix - 90 miles of Light Rail already approved
Pittsburgh - Two Light Rail Lines north from current, under construction line
Portland - Green Line (both routes, one funded, other "studied" for future build)
Raleigh-Durham NC - Streetcar plans
Sacramento - Additional Light Rail expansion
San Antonio - Light Rail plans voted down
St. Louis - All plans evaluated, perhaps 100 mile system
Salem OR - Streetcar plans
Salt Lake City - 90 miles of Light Rail, streetcar and Commuter Rail (vote soon to accelerate)
San Diego - Light Rail spur to North, another to West
San Francisco - New TransBay tunnel, trolley line, BART extension, eBART
San Jose - BART extension, several Light Rail extensions
Seattle - Proposed north extension
Spokane - Light Rail line planned
Tampa - 1992 and later plans
Toledo OH - Streetcar plans
Tuscon AZ - Streetcar plans
Washington DC - Tyson's Corner-Dulles extension, Purple Line, 40 miles of streetcar lines in DC
Winston-Salem NC - Streetcar plans



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