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the BENEDICT REPORT

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## *The World's Next Great Megatrend?*

*We presented this topic at our last 'Lunch with Benedict' and we received a lot of positive feedback from the attendees, so we thought we should put the information in a Benedict Report. This could be a huge mega-trend that has the potential to impact every country around the world…that's why we wanted to share it with you. Thanks for reading.*

The March *Benedict Report* was on 'America's Next Great Megatrend?' and how an abundant supply of cheap natural gas is changing America's energy future. This megatrend has continued to progress, with companies announcing plans for new manufacturing plants to be built here rather than overseas to take advantage of our cheap energy supplies and the increased development and use of natural gas engines in cars and trucks over more expensive diesel fuel.

The next megatrend we would like to introduce could potentially be 'The World's Next Great Megatrend?"

### A Global Infrastructure Boom

The global population is increasing rapidly and much of that population is far more affluent than in the past. The global middle class is expected to increase by 3 *billion* people over the next 18 years. To put that in perspective, there are currently 2 billion middle class people right now, so the global middle class is predicted to explode 150% in 18 years! *(SOURCE: Money Map Press)* This growing population will want and need good infrastructure. And, government leaders know that if they don't provide this infrastructure and make their populace happy, their government days are numbered.

> "Every week roughly 1 million people are born in or migrate to cities in emerging markets. By 2030 the global urban population is expected to grow by 1.6 billion people." *(SOURCE: "Emerging Market Infrastructure Set to Drive Demand for Commodities" The Economic Collapse)*

As people go from subsistence living in the rural area to the urban areas, they become more dependent on the regions infrastructure. Their quality of life will be greatly impacted by the quality of infrastructure in their communities. Examples include adequate food, clean water, good transportation and available energy.

Because of this growing population and shift to urban areas, governments are under enormous pressure to make these infrastructure expenditures. And countries that are behind-the-curve in infrastructure spending will probably be subject to internal stress.

Here in the United States, it is estimated that we need to spend $2.2 trillion on infrastructure repairs and upgrades just to bring our existing infrastructure up to "good condition." *(SOURCE: American Society of Civil Engineers)*

And, it is like this all over the world.

The chart on the next page shows estimated global infrastructure spending over the next *three* years equaling more than $6 trillion.

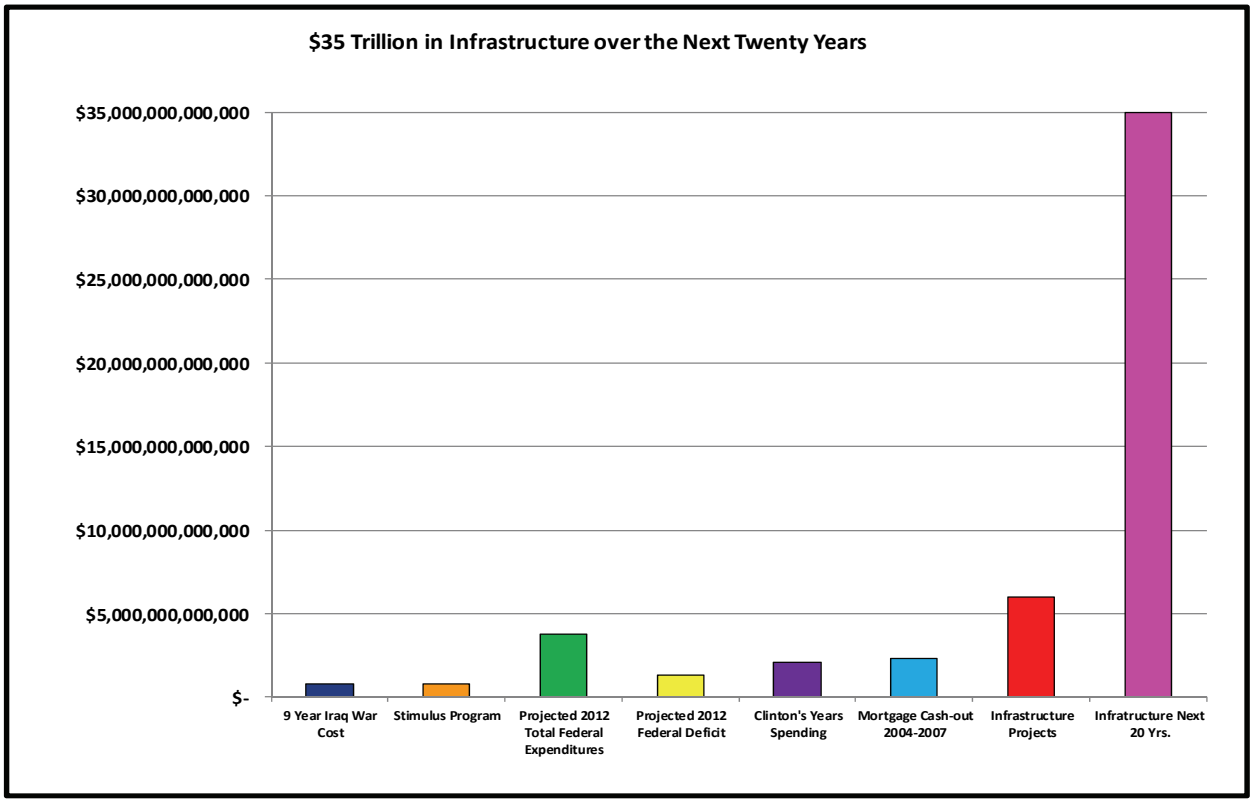
## $6 Trillion in Infrastructure over the Next Three Years

| | Construction | Energy & Power | Transport & Logistics | Water & Environment | Housing | Other | Total |
|---|---|---|---|---|---|---|---|
| China | 0.0 | 778.0 | 1,472.0 | 1,621.0 | 0.0 | 0.0 | 3,871.0 |
| Russia | | | | | | | 500.0 |
| Middle East/Gulf | 314.0 | 105.0 | 158.0 | 9.0 | 0.0 | 0.0 | 586.0 |
| India | 0.0 | 169.7 | 80.1 | 51.1 | 0.0 | 1.5 | 303.0 |
| Brazil | 0.0 | 251.0 | 56.0 | 17.0 | 150.0 | 43.0 | 517.0 |
| Mexico | 0.0 | 83.0 | 28.0 | 11.0 | 0.0 | 18.0 | 140.0 |
| South Africa | 0.0 | 54.0 | 13.0 | 2.0 | 6.0 | 40.0 | 115.0 |
| Turkey | 0.0 | 20.0 | 100.0 | 0.0 | 26.0 | 41.0 | 187.0 |
| CEE | 0.0 | 6.9 | 26.6 | 4.3 | 0.0 | 3.8 | 41.6 |
| **Total Average** | **314.0** | **1,467.6** | **1,933.7** | **1,715.4** | **182.0** | **147.3** | **6,260.6** |

**Figures quoted in US$B**

**Source:** BofA Merrill Lynch Global Research, Country Sources

This is a HUGE amount of spending on global infrastructure. And, these are massive projects that are being planned. Hundreds of billions of dollars in infrastructure spending in numerous countries around the world…all in the next three years! But, this is not a short-term trend that will end in a few years…this is a long-term megatrend that could continue for decades. And it makes this global infrastructure boom that much more important. It is estimated that *$35 trillion* will be spent on infrastructure over the next 20 years. *(SOURCE: CIBC World Markets)* Just to get an idea of the magnitude of this megatrend, below is a chart comparing estimated infrastructure spending to other past expenditures.



## What is Infrastructure?

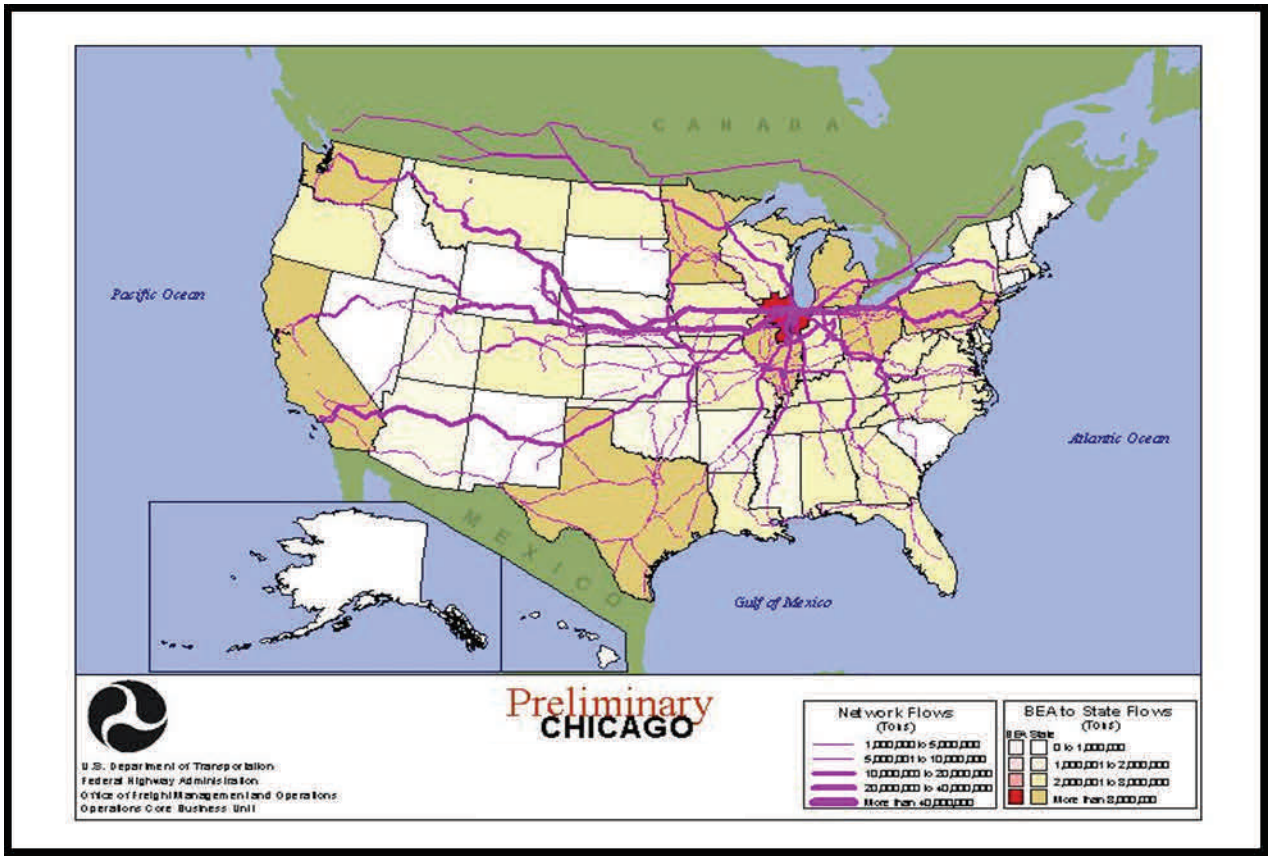
Before we go on, let's answer the question…what is infrastructure? Roads and bridges, right? Yes, of course. But, infrastructure also includes many other things, so let's look at some broad categories of infrastructure and detail a few examples:

### Transport and Logistics

This would include highways, roads and bridges. This would also include air, rail and shipping.

Here in the U.S., we have approximately 4 million miles of roads and 600,000 bridges. In the next 30 years, the U.S. population is expected to grow by 100 million people and highway traffic will double. This is not just a concern here; it's a major concern for countries all over the world. We need to think about how to handle this extra capacity and, maybe more importantly, we need to improve efficiencies in transportation and reduce the use of resources.

The U.S. has about 117,000 miles of rail, which is essential for the movement of goods around the country. Below is a map of the major rail lines and rail flow in this country. As you can see, Chicago is the nation's busiest rail center…and the most congested!!




The rail congestion in Chicago is so bad; freight trains allocate more time to *pass through* Chicago than to get from L.A. to Chicago. This is unacceptable! Businesses depend on getting their goods delivered efficiently and on-time. We must improve efficiencies within our supply chain in order to attract new companies and businesses and to stay competitive with other countries.

## Energy and Power:

This category includes fossil fuels and alternative energy sources. Fossil fuels such as oil, coal and natural gas provide the majority of the energy consumption around the world today. Alternative energy sources such as wind, solar and tidal are making significant advances as technology continues to expand their usage and increase their cost effectiveness.

Countries all over the world need an abundant energy supply, but sadly that is not the case today. There are approximately 2.7 billion people around the world without access to adequate energy services. And approximately 1.3 billion people with no access to electricity. *(SOURCE: Caterpillar, 2011 Sustainability Report)* The world desperately needs a huge investment in energy infrastructure.

But it's not just the production of energy and power, we must have efficient ways to transport and use that energy (for example…saving one gallon of gasoline is better than producing one gallon of gasoline, when cost, transportation and environment are considered). Technology can play a large part in increasing our energy efficiencies. For example, technology is being used to create Smart Grids, which are electrical grids that use computers and other technology to bring utility electricity delivery systems into the 21st century. Smart Grids basically "computerize" the electric utility grid. Also, 'smart communities' are being built in which home smart grid systems are being developed using systems such as: distributed clean energy, energy storage technology, smart meters, smart appliances, energy management systems, etc. *(One such community is the Mueller Community in Austin, TX)*

## Water:

Water is one of the Earth's most sacred resources…even though 2/3 of the earth's surface is covered by oceans. Below are a few facts:

97.5% of the Earth's water is salt water
2% of the Earth's water is locked up in the polar ice caps
0.5% is left over for us

The U.S. is fortunate in that we have an abundant amount of fresh water. We have the Great Lakes, which contain 21% of the world's fresh water! But, our water infrastructure is decaying and wasting billions of gallons of this non-renewable resource. It is estimated that water utilities will need to spend $20 billion over the next 20 years, above the current level of spending, to continue to provide safe and sufficient water to the American Public. *(SOURCE: "Building America's Future" (www.bafuture.org))*

But we have a much bigger problem…the world is in a global water crisis that currently affects one billion people. And 3.5 million people die annually from water-related illnesses.

And it's not just the amount of water required for hydration and sanitation…it's the fact that water is required in almost everything we manufacture and consume.

70% of the world's water is used for agriculture
U.S. Energy requires 20% of our non-agriculture water
A single microchip in a phone or computer requires 35 gallons of water to manufacture

We need to rethink our agricultural, industrial and energy practices in order to help solve our global water crisis. We need major changes…and that requires major innovation.

An example?

Dean Kamen, American entrepreneur and inventor, has invented a water purification device he calls Slingshot. The current version can purify 250 gallons of water a day using the same amount of energy it takes to run a hairdryer. The purification process is known as 'vapor compression distillation' and its power source has been designed to burn almost anything (including cow dung!). Kamen claims you can put the intake hose into 'anything wet' (including contaminated water) and the outflow is 100% pure drinking water. Kamen has even partnered with the largest beverage company in the world to use their vast distribution network to bring the Slingshot to remote parts of the world *(you can learn much more by searching 'Dean Kamen Slingshot' on the internet)*.

**Mining Infrastructure:**

Another category of infrastructure is mining, which is extracting valuable minerals or other elements from the earth. When you think of mining, you may think of an exhausted coal miner crawling from a mine in West Virginia, but the mining industry has changed drastically. Technology has brought significant advances to mining and mining infrastructure. We are beginning to use 'Autonomous Mining', which means controlling heavy machinery way down below from a computer in a control room. We are also starting to take advantage of "Remote Maintenance & Monitoring," which means all the machinery systems are being monitored remotely and maintenance issues can be detected immediately, which results in increased efficiency.

**Food Infrastructure:**

Food infrastructure is becoming more important as the world's population explodes, especially in and around urban areas. We have to think about food preservation issues as we transport food around the world. On average, 30-40% of the food in developed countries is lost due to spoilage. *(SOURCE: Food and Agriculture Organization of the United Nations)* We have to come up with new and improved ways to increase efficiency and reduce spoilage.

Genetically modified foods have the potential to dramatically increase crop yields in order to meet the demand of the world's increasing population. GM foods have created quite the controversy around such issues as increased yields, food safety, the effect on natural ecosystems and corporate control of the food supply.

Alternative Farming has become another way to supplement traditional farming, especially in urban areas. Rooftop farming and Vertical Farms can be utilized in urban areas as a source of local food production. This type of farming will not solve the world's hunger problems, but can be an efficient way to help supplement the food production in local communities living in crowded urban areas.

Hydroponics, a method of growing plants using mineral nutrient solutions in water rather than soil, is another type of alternative farming that has enormous potential. Several advantages include reduced water usage, no pesticide damage and increased stability and crop yields. A current disadvantage is the large amount of energy that is required, but advances in energy technology have the potential to help solve this problem.

Some startup companies are beginning to capitalize on hydroponic technology. For example, a startup company here in Atlanta has started growing lettuce and other greens in old shipping containers (they refer to them as 'modular controlled-environment growth pods') at a location near the Airport. The lettuce can be sold to local restaurants and grocers rather than transporting lettuce 2,000+ miles from California. The company claims a single pod can grow the equivalent of 1.5 acres of produce! This is just one example of exciting new developments in alternative farming.

Healthcare Infrastructure:

For healthcare infrastructure, we're not just talking about the traditional large hospital buildings. The world needs more efficient access to healthcare, specifically for those people not living in urban areas or close to traditional hospitals.

We have all experienced the long lines and waiting rooms at doctor's offices and hospitals. Surely, there has to be a better way, right?

Fortunately, technology is helping to bring traditional healthcare into the 21st century. How about using your Smartphone to diagnosis your illness and your diagnosis is immediately sent to your doctor or hospital? What about a machine that can detect diseases and cancers early just by analyzing your breath? These are just a few of the technological advances coming to healthcare in the near future.

But what about those countries and regions where they don't even have access to adequate healthcare? Or regions struck by natural disaster, like Katrina in Louisiana or the earthquake and tsunami in Japan. A new company is now designing and building 'mobile medical units', which can be driven or taken to wherever they are needed and can be set-up and fully operational in 20 minutes, with a patient care facility that includes multiple beds and full medical equipment. This has the potential to be the future of healthcare in many countries around the world where traditional hospitals cannot serve the majority of the population.

## How to Pay For It?

> "We've run out of money, so it's time to think"
> *(paraphrase Sir Ernest Rutherford)*

Now comes the fun part…how to pay for it?? Basically, countries cannot afford NOT to spend the money to upgrade their infrastructure. The amount of money spent, and by whom, will probably alter the balance of power in the world for decades. There will be winners and there will be losers.

The winners will be the countries that have the vision to "build for tomorrow." China is spending billions of dollars on new highways, new rail systems and new ports…with a long-term vision of the future in mind. The U.S. has been busy patching up old roads and bridges just as a short-term fix until we can come up with a better plan. China is paying for their infrastructure projects with savings; the U.S. is paying with debt.

Does this mean that we are behind?

YES…we are behind. But, it doesn't mean we will lose. It just means we need a vision for the future and a solid plan to work hard to achieve that vision.

So, what are some different options to help pay for infrastructure projects? Examples could be:

- Public-issued bonds
- User Taxes
- Tolls
- Gas Taxes
- Soft Drink Tax (Phil Benedict's favorite)

The above options can help, but what we really need is private investment. I think these projects need to start with the private sector, not the Government. And what do private investors want? They want a project worth investing in, they want a reasonable return on their investment and they want their investment to keep up with inflation.

The private sector needs to take the lead in funding these infrastructure projects. I mean, all we have to do is look at examples of other Government run agencies to see why…think Amtrak, Fannie Mae, and the Postal Service. We don't need another federal agency financial disaster on our hands!

You may be asking…okay, where is all this private money you are talking about?

There is approximately $26 trillion in private Pension Funds. There is approximately $18 trillion in 401(k) accounts. Another $8 trillion or so in IRA's and Defined Benefit Plans. *(SOURCE: Towers Watson's Global Pension Assets Study)* And if we add the money in Endowments, Foundations and Sovereign Wealth Funds, there is about $100 trillion dollars out there that is looking for a good stable investment home.

Typically, the Government comes up with how much they need for a project, wants us to trust them and give them the money and assume they will do a good job. That will not work going forward. Private investors will want a reasonable return on their investment so they will be very concerned with the initial cost (investment) and the annual revenues (from tolls or whatever). They will not allow the typical excess costs and overruns that seem to exist in so many government projects.

This idea of private investment is not a new idea. Private companies (meaning not government controlled) have been buying and managing infrastructure assets for years. Some examples:

- Most utility and electricity infrastructure is regulated by the Government, but owned by private companies
- Oil and natural gas pipeline infrastructure…all built and owned by private companies
- A number of toll roads, parking structures and meters are now owned by private companies/investors

This global infrastructure boom is going to be different…we need to be creative in our funding ideas in order to get it all done. It's going to take brains and leadership. And we must keep the Government under control. It will be difficult to keep the Government's fingers out of it, but it's probably the only way it's going to work.

## Potential Problems?

What could stall this next potential global megatrend? You probably guessed it… government and bureaucracy. Also, the idea of making companies or investors 'prove' something is not going to happen in order to get their project approved. We can't make companies/investors jump through all sorts of hoops in order to build these infrastructure projects. We just cannot afford to waste too much time with ridiculous requirements. Here is a local example:

- The Port of Savannah received approval from the Army Corps of Engineers to deepen the Port to accommodate larger container cargo ships. The Army Corps of Engineers' final report was issued after 14 years of study. (*Atlanta Business Chronicle, April 11, 2012 )*

Unbelievable!!

We will not keep up with the rest of the world in this global infrastructure race by taking 14 years to make a decision!

## What We Need?

Like I mentioned earlier, we need private investment to lead the charge in this global infrastructure boom and not the Government. We also need trust…and people (private investors included) don't trust the Government right now. Consider this:

> A near unanimous 94 percent of Americans are concerned about our nation's infrastructure, and 81 percent are willing to pay more in taxes to rebuild it. But over 60 percent say that accountability and transparency in how the funds are spent are their highest priorities.
> *(SOURCE: "Building America's Future" (www.bafuture.org))*

The money is there, but there must be trust and accountability in order for private investment to commit the funds.

This potential megatrend could create a lot of jobs, especially local jobs. But, do we have enough skilled workers? I'm not sure.

> Almost 70% of the advanced engineering degrees earned in the U.S. are non-U.S. citizen students. *(SOURCE: National Science Foundation)* And a lot of those students aren't allowed to stay here. (I know this is a political hot button, but we need to deal with this issue)

We need engineers, not bankers. We don't need workers who can shovel; we need workers who can remotely operate a high-tech bulldozer. We need workers with skills, not just muscle.

We also need smart educators who can blend the new high-tech learning environment with the traditional classroom setting.

We need people who can identify and solve problems. We don't need people who are the problem.

This is an economic war that will affect generations to come. The winners will gain global dominance for decades to come.

Are your grandchildren ready?

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Information for this article came from these sources as well as other general reading:


"Abundance – The Future is Better Than You Think" by Peter H. Diamandis & Steven Kotler
Wikipedia on Dean Kamen
"Everything is Falling Apart" *The Economic Collapse*
Towers Watson www.towerswatson.com/
"Building America's Future" *www.bafuture.org*
*www.muelleraustin.com*
*www.podponics.com*

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