

# ASFE

*Fall Meeting*

Paradigm Possibilities: Paralysis,  
Pandemonium, or Progress?

Arthur B. Shostak, Ph.D.

*Friday, October 2, 2009*  
*8:15AM - 9:45AM*



Arthur B. Shostak, Ph.D.

Arthur B. Shostak, Ph.D., is a Professor Emeritus of Sociology at Drexel University (Philadelphia, PA). A professional long-range forecaster for over 40 years, his 33 books and 165 articles explore options in responding to the probable, possible, preferable, and preventable future. He has focused in particular on challenges in work and organizational matters, in education and learning, and energy and environment. His forecasts have appeared in Business 2.0, the New York Times, and WIRED, among other such publications. In 2006, the American Sociological Association gave him a lifetime achievement award for his contribution to applied sociology. He welcomes exchanges of ideas ([arthurshostak@gmail.com](mailto:arthurshostak@gmail.com)).



ASFE 2009 Fall Meeting

Key Game Changers  
in a  
Critical Infrastructure  
Paradigm Shift –  
Today and Tomorrow



Arthur B. Shostak,  
Emeritus Professor, Drexel University

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Agenda

1. Call for Action! 2009 Report of the National Research Council:  
Sustainable Critical Infrastructure Systems. Urges action on behalf  
of an overdue Paradigm Shift.
2. Setting the Scene: Four High Probability/High Impact Forecasts –  
linked to A-S-F-E – and bearing on the desired Paradigm Shift.
3. Key Agents of Change: Current/Contenders.
4. Scenarios: Paralysis. Problematic. Progress.
5. Wild Cards – “Tax More Tomorrow” Legislation; North America  
Approach; Climate Engineering; Military Security.




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Critical Infrastructure Systems

Power,  
Telecommunications,  
Transportation,  
Wastewater, and  
Water

A system of systems – airports; electricity generation, transmission, and distribution; highways,  
ocean ports, railways, water and waterfront facilities, and so on – that help create the conditions  
for economic productivity, business creation, and equity.

Sometimes called Lifeline Systems, they are physically visible and symbolically important projects  
with a long life expectancy (at least 20 years).<sup>1</sup>

There are “links between some of the imperatives of the 21<sup>st</sup> century – economic competitiveness,  
global climate change, reducing U.S. dependence on imported oil, disaster resiliency, and  
environmental sustainability – and the performance of critical infrastructure systems.”<sup>2</sup>

Thomas H. Anderson, “Roadmap for Infrastructure,” in Arthur B. Shostak (ed.),  
The Future of Critical Infrastructure: A Guide for Strategy and Investment, October 2009.  
<sup>1</sup>Sustainable Critical Infrastructure Systems: A Challenge for Meeting 21<sup>st</sup> Century Imperatives  
Report of the National Research Council, 2008, 4.

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**CALL to ACTION**

"How we as a nation chose to renew our critical infrastructure systems in the coming years will help determine the quality of life for future generations.

It will also help determine our success in meeting other national challenges, including those of –  
 remaining economically competitive,  
 reducing our dependency on imported oil,  
 and dealing with issues related to  
 global climate change,  
 national security,  
 energy independence, and  
 disaster resilience."  
*(italics added)*



**Sustainable Critical Infrastructure Systems –  
 A Framework for Meeting 21<sup>st</sup> Century Imperatives**  
 Report of the National Research Council, 2009

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**Critical Infrastructure Systems –**

Power, Telecommunications, Transportation, Wastewater, and Water

"These systems account for 69 percent of the nation's total energy use and for more than 50 percent of the greenhouse gas emissions linked to global climate change. ...

... Large segments and components ... are now 50 to 100 years old. Their performance and condition are deteriorating, as evidenced by transportation congestion, air and water pollution, and increasing instances of power and other service disruptions."

... the materials, technologies, and methods chosen to renew critical infrastructure systems will be a determining factor in whether the nation will be able to meet some of the greatest challenges of the 21<sup>st</sup> century. "

**Sustainable Critical Infrastructure Systems –  
 A Framework for Meeting 21<sup>st</sup> Century Imperatives**  
 Report of the National Research Council, 2009

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"... approaching infrastructure renewal

by continuing to use

the same processes, practices, technologies, and materials  
 that were developed in the 20<sup>th</sup> century  
 will likely yield the same *[inadequate]* results:

increasing instances of service disruptions,

higher operating and repair costs, and

the possibility of catastrophic, cascading failures  
 such as those in New Orleans in 2005 following Hurricane  
 Katrina."

*(italics added)*



**Sustainable Critical Infrastructure Systems –  
 A Framework for Meeting 21<sup>st</sup> Century Imperatives**  
 Report of the National Research Council, 2009

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We need a wholesale reinvention of the global energy and infrastructure economy to ward off catastrophic climate disruption.

By 2050 we should have earned a reduction in greenhouse gases worldwide to about 80% lower than in 1990.

This requires our making – worldwide – immediate gains in the small stuff (weatherizing homes, driving electric cars, etc.) and scaling up every low-carbon energy source while upgrading all the other critical infrastructure components.




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"If the nation is to meet some of the important challenges of the 21<sup>st</sup> century,  
**a new paradigm**  
for the renewal  
of critical infrastructure systems  
is needed."

Sustainable Critical Infrastructure Systems –  
A Framework for Meeting 21<sup>st</sup> Century Imperatives  
Report of the National Research Council, 2009

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### Paradigm Shift-

A consequential shift in basic assumptions that can cause us to see the same information in an entirely different way; a new gestalt (Thomas Kuhn, 1962);

an often radical change in worldview (e.g., the implosion of the Soviet Union and the exposure thereby of fatal weaknesses in forced draft socialism)

and in how we see ourselves (e.g., the "Earthrise" photo taken from the moon in 1969 helped usher in the Environmentalist Movement; the Pill's arrival in 1960 helped lead to the Sexual Revolution and Modern Feminism).

(Wikipedia, July 31, 2009)




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### Modern Paradigm Shifts-

#### Personal Level -

- Abortion on request (legalization thereof)
- Adoption by Gay Couples (legalization thereof)
- Euthanasia (legalization thereof; Montana, Oregon, Washington)
- Same-Sex Marriage (five state legalizations)
- Smoking (Medical) Marijuana (e.g., California has world's largest legal market)
- Smoking and Secondary Smoking Prohibitions (legalization thereof)
- Smoking by Youth (now at lowest level ever)

#### Societal Level -

- Earth Mechanics
- Nuclear Global Weaponry
- People with Intellectual Disabilities
- Machine Intelligence




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What do we believe about the conventional Critical Infrastructure Paradigm that seems unlikely to occur,  
but - if it did happen, would fundamentally change reality?

Many Americans probably believe infrastructure renewal will continue to use essentially the same processes, practices, technologies, and materials developed in the 20<sup>th</sup> century - the "same old, same old."

A Paradigm Shift here  
 would  
 fundamentally change reality.

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#### Paradigm Shift Achievement Possibilities -

1. A vision for the future configuration, level of performance, or level of services that critical infrastructure systems should provide.
2. Diverse array of organizations and activists working together collaboratively in a structured way.
3. Emphasis on developing NEW approaches, concepts, materials, methods, etc., as part of cost-effective long-term solutions.




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Paradigm Shift Achievement Possibilities –

4. Performance measures to provide transparency about infrastructure investments.
5. A plurality of VOTERS agreeable to adequate outlays of public funds, and to governmental support for private sector investments.
6. Advocates throughout K-16 education helping to bring along young recruits to continue the effort.




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To get there from here we must first identify relevant high probability/high impact developments -

A = Accelerated Climate Change; likely to impact significantly on everything – bar none.

S = Security Angst; anxiety, apprehension, and insecurity linked to defense, economic, "9/11," pandemic, and other uncertainties seemingly beyond acceptable resolution.

F = Frugality; opposition to increased public outlays; disinclination to assume more private household debt.

E = Entrepreneurial Ethos – the fastest-rising cadre of influential Americans are those drawn to entrepreneurial values.

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A = Accelerated Climate Change; likely to impact significantly on everything – bar none.

"Climate change is THE canvas on which the history of the 21<sup>st</sup> century will be painted."

Rapid temperature increase is likely for next 30 years from CO<sub>2</sub> emissions already in the atmosphere. A 1 degree C [1.8 degree F] increase seems unavoidable in the next decade or so (given current levels of Greenhouse pollutants in the atmosphere).

In 2009, ocean surface temperatures measure the warmest in 153 years. In the Arctic region the decade 1998 to 2008 was the warmest in 2000 years.\*\* By 2035 we will need a new name for Glacier National Park.

\* Lynas, Mark. *Six Degrees: Our Future on a Hotter Planet*. Washington, DC: National Geographic, 2008, 22.  
 \*\* Andrew C. Revkin. "Global Warming is Delaying Ice Age, Study Finds." *New York Times*, September 4, 2009, A-17.




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### BOILING THE FROG

"The consensus of the climate experts is utterly terrifying.

At this point [July, 2009], the central forecast of the leading climate models – not the worse-case scenario but the most likely outcome – is *utter catastrophe*, a rise in temperatures that will totally disrupt life as we know it, if we continue along our present path.

... climate change is a *creeping threat rather than an attention-grabbing crisis*. The full dimensions of the catastrophe won't be apparent for decades, perhaps generations. In fact, it will probably be many years before the upward trend in temperatures is so obvious to casual observers that it silences the skeptics.

Unfortunately, *if we wait to act until the climate crisis is that obvious, catastrophe will already have become inevitable.*" (italics added)

Paul Krugman, "Boiling the Frog," *New York Times*, July 13, 2009; A17.

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### Adaptation has some POSITIVE BENEFITS

#### Examples:

- 1) "If we prepare societies for more ferocious hurricanes in the future, we also prepare them to cope better with today's extreme weather."\*
- 2) "Farmers in areas with less water for agriculture could use more drip irrigation, while those with more water could grow more crops."\*
- 3) The New Urbanism Movement encourages exercise promotion, family-centrism, and reduced reliance on car use.

\*Bjorn Lomborg, "Technology Can Fight Global Warming," *Wall Street Journal*, August 28, 2009; A15.

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### S = Security Angst

- 1) Public confidence in ability of government to manage the Economy has fallen to 1930s low level.
- 2) Public trust falters in (post-Katrina) ability of government to alleviate toll of natural disasters or prevent a second 9/11.
- 3) Public reliance on government to renew job-generating processes remains uncertain at best;

little trust exists, as well, in the ability or intent of the private sector to create good new jobs in adequate numbers.

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F = Frugality, opposition to assuming more private household debt and to increased public outlays.

- 1) Household debt per person nearly doubled between 1997 and 2007, from about \$25,000 to \$46,000 (higher now in 2009).

A gradual reduction of massive consumer debt will take years to achieve: thrift is "in," profligate consumption is out.

Many feel compelled to live within their means.

- 2) Having lost a huge amount of wealth in the 2008-9 Housing Bubble Burst, people are now saving more – the household savings rate (almost 7%) is the highest in the last 15 years.

- 3) Pressure grows to adopt a V.A.T. consumption tax to discourage spending and encourage even more savings (once politically unthinkable).

F = Frugality

"... the single biggest challenge facing the United States today is that the American economy *does not seem able to provide enough jobs – and nowhere near enough good jobs* – to maintain the standard of living most Americans have come to expect.

... the economy has fewer jobs now than in 2000, even though the labor force has grown by around 12,000,000 workers since then."

"The weight of more than 20 million marginally employed or unemployed, combined with the increasing pace of economic activity outside the U.S., presents the prospect of permanent change in the American economic landscape: *high unemployment, moderate to weak growth, and soaring corporate profits.*" \*\* (italics added)

\*Bob Herbert, "A Soary Reality," New York Times, August 11, 2009; A-21.  
\*\*Karabell, Zachary, "Corporate Earnings are No Sign of Recovery," Wall Street Journal, August 10, 2009; A11.

E = Entrepreneurial Ethos

"...in the last decade something quite remarkable has happened, a point of cultural inflection in our nation's history as profound as the 1960s or 1920s, but far more subtle and much less noticed: the United States has become the first true entrepreneurial society in history."

"... entrepreneurs create most of the innovation, almost all of the new jobs, and most of the new wealth."

"... [this new ethos] embraces the kind of individualism, independence, self-management, self-employment, and higher-risk lifestyle we typically equate with the entrepreneur."

"We are already there, and the rest of the world is following along only a few steps behind."

Michael S. Malone, The Future Arrived Yesterday: The Rise of the Protean Corporation and What It Means for You. NY: Crown, 2009; 251-252.

### E = Entrepreneurial Ethos

- 1) Devalues highly-structured organizations (traditional bureaucracies), hide-bound institutional rules ("Because I say so!"), and mass movements (advocacy organizations, churches, political parties, etc.).
- 2) Champion the emergence instead of "Protean" Organizations – nimble shape-shifters able to change direction and act like perpetual entrepreneurial start-ups.\* Anchored by a small Core that provides stability through their knowledge of the organization's culture, history, and values.
- 3) Enthusiasts place a high value on retaining their own independence, their freedom of motion, and the management of their own lives.
- 4) Skeptical of rallying calls emanating from current stripe of office-holders.\*\* Skeptical of declaration of crisis, emergency, etc.

\*Michael S. Malone, *The Future Arrived Yesterday: The Rise of the Protean Corporation and What It Means for You*, NY: Crown, 2009; 251-262.  
 \*\*Daniel Henninger, "The Revolt of the Masses," *Wall Street Journal*, September 3, 2009, A-15.

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A paradigm shift does NOT just happen –  
 as it opposed by stalled thinking;

A paradigm shift is driven by consequential agents of  
 change.

#### Who are the Key Game Changers – Today and Tomorrow –

people who can help promote  
 the Paradigm Shift  
 sought by the National Research Council,  
 a change  
 ASFE  
 can distinctly aid and abet?




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### Five Key Agents of Change

#### CURRENT

- 1) Environmentalists
- 2) Quarter-focused Leaders
- 3) "Do Something!" Believers
- 4) United States
- 5) Nation States/International Treaties

#### Contenders

- 1) Ecopragmatists
- 2) Horizon-focused Leaders
- 3) "Do Something Else!" Believers
- 4) Other Nations
- 5) World Government

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1) Current – *Environmentalists* –

Owed credit for calling early attention to climate hazards, and helping to raise "green" consciousness long before it became popular, etc.

But, many activists can be anti-scientific and ideologically rigid (e.g., dismiss nuclear out of hand, and judge "clean coal" as vaporware, an idea that exists mostly in the lab and in the minds of most coal-state politicians).

Suspicious of motives of business leaders, the media, politicians, regulators, etc., and this impedes alliances with any and all.

The Movement is weakened by deep-rooted internal rifts.

It is a likely target for growing public exasperation with "Green" inconveniences, costs, etc.

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CURRENT – *Environmentalists*

CONTENDER – *Ecopragmatists* –

Combine "Green" with support for science;

Knowingly endorse -

bioengineering,  
macro-engineering,  
biogenetics,  
GMO foods,  
nuclear power,  
solar-in-space projects, etc.



(Steward Brand; [www.edge.org](http://www.edge.org); August 20, 2009)

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CURRENT – *Quarter-focused Leaders*.

Have a business and/or legal background (e.g., senior members of Congress, corporation CEOs, heads of major NGOs, members of Parliaments, heads of mainstream political parties, etc.)

Employ a mental paradigm strong in debate skills, pervasive doubts, precedent guidance, and wide-ranging misgivings.

Thrive on minimizing risk and covertly protecting the status quo.

Conspicuous among modern male Western leaders over 45.




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Current – Quarter-focused Leaders

CONTENDERS – Horizon-focused Leaders:

Have a background in Consulting, or Engineering, or Information Sciences, or Science (especially R&D).

Have an *entrepreneurial paradigm*.

Are strong in anticipatory skills (employ futuristics, etc.), analytical skills, humanistic "wisdom," and systems thinking.

Value candor, flexibility, informality, innovation, and speed.

Have a "can do!" problem-solving attitude. Thrive on besting challenges through interdisciplinary synergies. Alter our sense of possibilities.

Conspicuous among some modern Chinese and Indian leaders who think in terms of decades and generations, while many Western leaders are focused on short-term conventional priorities.

(www.efdaa.org, August 20, 2008)

CURRENT – "Do Something!" Believers

CONTENDERS – "Do Something Else" Delayers

Proposed reforms that address climate change have an unacceptable benefit-cost ratio.

The benefits are far into the future, while substantial costs are upfront and immediate:

*"Given the uncertainties associated with both the projections and the consequences, climate change cannot compete with other urgent issues we confront*

*[#1, Communicable Diseases;*

*#2, Malnutrition and Hunger;*

*#3, Sanitation and Access to Clean Water;*

*... #13, 14, 15, Climate Change]*

*although it is clear some steps must be taken now to forestall adverse consequences down the road."*

Douglas. C. North, Nobel Laureate

Lomborg, Bjorn, ed. *Global Crisis, Global Solutions*. Cambridge University Press, 2004.

CONTENDERS – "Do Something Else" Delayers

1) A dollar spent on ensuring people are healthier returns \$20 in economic benefit;

2) A dollar spent on improving nutrition returns \$16 in economic benefit;

3) A dollar spent on R&D into cleaner energy, \$11 in economic benefit;

4) A dollar spent on stopping one catastrophic event caused by transnational terrorists, \$9 in economic benefits;

5) A dollar spent cutting CO<sub>2</sub> to combat climate change returns ONLY 90 cents in economic benefit (and this is even when things like environmental damage are taken into account).

Lomborg, Bjorn, ed. *Global Crisis, Global Solutions*. Cambridge University Press, 2004.

#### 4) Key Agents of Change

CURRENT – United States.

CONTENDER – Other Nations.

America is no longer always and in everything a global pacesetter, and certainly not in matters of critical infrastructure systems (or health care, green technologies, transportation, and wireless technologies, etc.).

Could adapt lessons from remarkable pacesetters like –  
 Canada (natural gas fuel for vehicles; Social Indicators Reports)  
 China (New City design, solar power equipment),  
 Denmark (solar and wind power),  
 France (nuclear power provides 80%),  
 Germany (Zero-Cost homes),  
 Holland (island creation; ocean-level control),  
 Iceland (geothermal and hydro power),  
 Israel (desalination, hydroponics, solar power),  
 Japan (island creation, high-speed railroads),  
 Norway (hydro power),  
 Nova Scotia (tidal power),  
 Spain (solar power), and so on.

Paul Sherron, *After America: Narratives for the Next Global Age*, 2009

CURRENT – (Competitive) Nation States and International Treaties among them.

Progress here had the U.S. invite the G20, rather than only the G7 nations, to a 2008 Summit. As well, it is likely the U.S. will be a signer of the 2012 post-Kyoto Treaty on Climate Change.

CONTENDER – World Government (second-best option), circa 2025.

*"Climate change is a world-sized problem that will take world-sized solutions that involve forms of government we don't have yet. It involves techniques we are just glimpsing. It involves what ecologists call ecosystem engineering ... we have to do it on a planetary scale."*

(Steward Brand, "We Are as Gods and Have to Get Good at It," [www.edge.org](http://www.edge.org); August 20, 2009)

#### FORECAST: Paralysis. Problematic. Progress.

1) Paralysis Scenario – No paradigm shift:

Political leaders may prove unable to significantly reduce carbon emissions anytime soon.

Industry lobbyists may succeed in tying up legislation and/or watering down penalties and enforcement mechanisms.

Senators from 10 states that produce coal or depend on energy-intensive industries have signaled their "reluctance" to support any 2010 climate bill that has the tough measures needed to cap emissions.

They insist it must "protect" American industries from exports from countries that do not impose verifiable comparable restraints on emissions ... even though they know how very difficult this verification will be to achieve.\*



\* Editorial "A Real Bill for the Climate," *New York Times*, August 10, 2009, A-16

The public may lose confidence in "Green" reform measures and results.

Many may come to oppose measures that would entail significant immediate personal "sacrifice" on behalf of distant critical infrastructure gains.



"Environmentally friendly energy projects are running into the same cries of 'not in my backyard' that stymied a previous generation of alternative-power efforts ... The protests echo grassroots opposition that has blocked nuclear plants and energy-producing trash incinerators for decades."\*

Deficit estimates of \$9 trillion over the next ten years raise the prospect of an American "banana republic" – endlessly printing money, weakened by inflation, and abandoned by foreign bond investors ... a prospect that makes huge new public outlays unlikely.

\*Jeffrey Bell, "Renewable Energy: Meet the New Naysayers," Wall Street Journal, September 4, 2008, A-13.

Retired Boomers are likely to shape the political agenda in their narrow favor. By 2030, we can expect more Americans over 65 than under 18, and that could result in a game-changing *Gerontocracy*.

2020 Forecast (Europe): "The high proportion of elderly people has led to a qualitative change in the fabric of society.

At no time previous in history has such a high number of mentally and physically capable old people played so prominent a role in industry or in cultural and political life."

TNS Infratest, *Horizons 2020: A Thought-Provoking Look at the Future*, Munich, 2006, xiv.



## 2) Problematic Scenario - Trivial Paradigm Shift: "Muddling Through."

Many Senators, while talking "green," are likely to put the interests of "heavy weight" constituents above all else.

Critical infrastructure gains in cities and states are likely to remain singular.

The public is likely to stay distracted by pressing personal stresses, and remains fatalistic about critical infrastructure shortcomings.



Many citizens place their hope in a "Gee Whiz!" Techno Fix\* - e.g., *algae-based fuel, ammonia in fuel cells, fusion energy, hydrogen fuel, mag-lev transit, solar-in-space*, etc.  
which they expect very soon and at affordable start-up costs and product prices.

e.g., some believe painting all roads and roof in the world's 100 largest cities white could offset 44 billion tons of greenhouse gases – the global warming effects in a year of the human population.

(Physical Organization, 9/19/2008)

Many citizens prefer to wait rather than act on, or pay now for costly problematic reforms that may or may not bring long-off rewards.



Some are confident their grandchildren – as adults – will have far better tools with which to solve problems than now available. (Critics fear we are squandering precious time)

#### Problematic Scenario – Uncertainty reigns ....

##### Example: High-Speed Passenger Rail Service -

President Obama's administration is the first to put this high on the domestic agenda and put serious money behind it.

The federal government has allocated \$13 billion to spend by 2014 in 10 "corridors" (including the Dallas-San Antonio-Houston triangle).

Advocates claim it will relieve traffic congestion (replace one million cars), reduce oil imports, and mean fewer highway accidents (278 plans have come to DoT from 40 states and D.C.).

As well, trains are 28% more efficient in carbon reduction than passenger vehicles on a passenger-per-mile basis.

Success here can help us catch up with other advanced nations who already operate such national rail systems (Europe's bullet trains run at an average of about 130 m.p.h.; Japan's, 180 m.p.h.).

(Michael Meyer, "The Third Way," Scientific American, August 2008, 16)

Opponents (including the aviation and auto industries) estimate 10 "corridors" could cost \$125 billion, at a cost of \$40 to \$60 million per mile.

HUGE costs; meager public benefits.

May never be recouped from passenger fees; will require costly subsidies (Amtrak costs about a \$50 subsidy per trip; has cost almost \$35 billion since 1971; serves 78,000 of 140 million Americans who go to work daily).

Even if one million cars are replaced, this will equal less than 1% of the U.S. auto fleet (254 million of the world's 700 million vehicles in 2007).<sup>2</sup>

All the promoters have to show for 30 years of effort are dusty feasibility studies.

USA lacks the density required for high-speed rail systems: Japan, 680 per square mile; Britain, 653; Germany, 611; France, 258; USA, 86. Cars can pick up and drop off people in low-density situations.

Funds should go INSTEAD to cover HUGE maintenance backlogs in urban mass transit systems: New York, \$17 billion; Chicago, \$10 billion; D.C., \$12.2 billion; San Francisco, \$5.3 billion.

"Any high speed rail system should be financially locally; states should decide their transportation priorities."

In July, 2009, the Obama Administration indicated it was putting off dealing with a National Transportation Bill for another year and a half.<sup>3</sup>

<sup>2</sup>Robert J. Samuels, "A Real Roadmap: Moving at High Speed," *Washington Post*, August 20, 2009, 23.  
<sup>3</sup>Editorial, "America's High-Speed Train," *New York Times*, August 1, 2009, A 14



Problematic Scenario –

Example: Climate Bill "Price"

The American Clean Energy and Security Act of 2009 (the Waxman Markey bill), soon to get Senate consideration, sets caps "so loose in the early years that through the use of cheap offsets the U.S. need not significantly reduce its fossil-fuel emissions until about 2025 [17% by 2020].

Then the bill would require a nosedive in fossil-fuel emissions.

This pledge of big cuts later is unlikely to be kept."

Passage in 2009 will require accommodation with the opposition (as with Medicare's passage, it could mean very WEAK control of costs).



David Schoenbrodt and Richard B. Stewart, "The Cap-and-Trade Rat and Switch," *Wall Street Journal*, August 24, 2009, A-13.

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Problematic Scenario –

The global cost of adapting to global warming has been grossly underestimated, according to a report released on 27 August by the International Institute for Environment and Development in London.

It could be at least 2–3 times more than the 2007 estimate from the United Nations Framework Convention on Climate Change of between \$49 billion and \$171 billion per year, the study's authors say.

*Nature*, September 2, 2009, 24.

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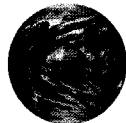
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3) Progress Scenario –

ASFE, in collaboration with many allies, helps America slowly and steadily achieve a PARADIGM SHIFT in favor of creating "critical infrastructure systems that are physically, economically, socially, and environmentally sustainable for the next 50 years."\*



\*Sustainable Critical Infrastructure Systems –  
A Framework for Meeting 21st Century Imperatives  
Report of the National Research Council, 2009

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Progress Scenario –Example: Natural Gas-using Vehicles

The USA in 2009 had less than 150,000 of 10,000,000 natural gas vehicles in the world.\*

However, cities, states, and the federal government – along with major ports – are now conspicuously switching over, and boasting about it loudly (as with proud colorful signs on the sides of natural-gas-using municipal buses, school buses, etc.).

As 70% of imported oil goes to cars and trucks, with the average car producing 10,000 pounds of emissions a year, an increase in vehicle use of natural gas would seem a major gain.

T. Boone Pickens and Ted Turner, "New Priorities for Our Energy Future," *WSJ*, August 17, 2009, A-11).

Progress Scenario –Example: Electrical Grid "Smarts"

"If the U.S. electric grid was just 5% more efficient, it would be like permanently eliminating the fuel and greenhouse gas emissions from 53 million cars.

Billions are wasted generating energy that never reaches a single light bulb.

Fortunately, our energy can be made smart ... the intelligent utility system actually looks a lot more like the Internet than like a traditional grid ....

Smart grid projects are already helping consumers save 10% on their bills and are reducing peak demand by 15%. Imagine the potential savings when this is scaled to include companies, government agencies, and universities. ....

Our electrical grids can be a symbol of progress again – if we imbue the entire system with intelligence. And we can." (Ad. IBM: Conversations for a Smarter Planet." *The New Yorker*, August 31, 2009, 3).

[BUT – the Battelle Group estimates it could cost \$2 trillion over the next 20 years to adequately upgrade the Grid. (CNN Money Com; Jan. 1, 2009).]

Progress Scenario – "Wild Card": "Tax More Tomorrow" Legislation

1. Enact legislation now to phase-in tax on carbon-based fuels only after unemployment has fallen below 8%.
2. Gasoline taxes could be increased by 10 cents per gallon for each of the 20 months after the target employment rate is reached.
3. Everyone is likely to seek more energy efficient systems.
4. The typical family's income net of taxes will still be higher each year than the year before ... as appliance, cars, and factories become more productive and give more power for less energy (and produce far less pollution).
5. Use is made here of Behavioral Economics to structure tax increases to avoid reflective opposition (a tool popular with the Obama Adm.).

\*Robert H. Frank, "Post-Consumer Prosperity," *The American Prospect*, April 2, 2009, 14 (14-15); Thomas L. Friedman, "Moore's Law and the Law of More," *New York Times*, April 26, 2009, 12)

Progress Scenario – "Wild Card": Take a North America Approach

The status quo in all three NA countries is neither strategically nor financially responsive to current needs to upgrade critical infrastructure systems: The USA needs to invest about \$250 billion more annually than at present; Mexico, about \$40 billion; and Canada, about \$36 billion.

We need a 3-nation system that boasts a well-designed and maintained REGIONAL critical infrastructure system.

Why REGIONAL? Because globalization makes a non-coordinated approach on this continent both costly and self-defeating.

North America needs to become increasingly competitive via a new regional platform capable of explosive growth on behalf of its 450 million citizens.

Narman F. Anderson, "Outlook for Infrastructure," in Armand B. Pechereau-Overlin, ed. *The Future of North America*, D.C.: Center for Strategic and International Studies, 2008.

Progress Scenario – "Wild Card": Climate Engineering –

Example: Marine Cloud Whitening Technology

Boats could spray seawater droplets into clouds above the sea to make them reflect more sunlight back into space – augmenting the natural process where evaporating ocean sea salt helps to provide tiny particles for clouds to form around.

Proponents estimate about \$9 billion spent here might be able to cancel out this century's global warming.

The benefits – from preventing the temperature increase – would add up to about \$20 trillion.\*

\*Bjorn Lomborg, "Technology Can Fight Global Warming," *Wall Street Journal*, August 28, 2009, A15.

Progress Scenario – "Wild Card": Leverage National Security Concerns

Some hard-boiled strategists maintain the U.S. will get serious about climate change ONLY after declaring it a TOP source of military threats.

The Pentagon in 2007 warned ominously that climate change is a "threat multiplier" that could lead to wide conflict around the globe over increasingly scarce resources (arable land, food supplies, oil, water, etc.).

American armed forces could be drawn in either to help restore order and/or to defend our access to our allies, supply routes, or oil.

To help assure its military readiness, the U.S. would have to FIRST get serious about upgrading its critical infrastructure system.

Editorial, "The Climate and National Security," *New York Times*, August 18, 2009, A-16.



REMINDER: Paradigm Shift Goals –

1. A vision for the future configuration, level of performance, or level of services that critical infrastructure systems should provide.
2. Diverse array of organizations and activists working together collaboratively in a structured way.
3. Emphasis on developing NEW approaches, concepts, materials, methods, etc., as part of cost-effective long-term solutions.
4. Performance measures to provide transparency about infrastructure investments.
5. A plurality of VOTERS agreeable to adequate outlays of public funds, and to governmental support for private sector investments.
6. Advocates throughout K-16 education helping to bring along young recruits to continue the reform effort.




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In sum, a PARADIGM SHIFT could make possible achievement of optimum critical infrastructure - first in America, then in North America ... and even as this is occurring, as a MODEL for the rest of the world.

We could address the BIG THREE - climate change, critical infrastructure renewal, AND our need to boost general prosperity -- by promoting opportunities throughout the entire income spectrum ("green" jobs, pilot climate engineering projects, etc.) and power it all with efficient use of CLEAN energy.

This could prove THE greatest economic and social opportunity of the first half of the 21<sup>st</sup> century.

**PARADIGM SHIFT**, anyone?

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# ASFE

*Fall Meeting*

## Social Network Part I – Network at Work

Kevin Knebl

*Friday, October 2, 2009*  
*10:00AM - 11:00AM*





# Using LinkedIn and Social Networking to Increase Your Business!

Presented by Kevin Knebl of Knebl Communications at  
ASFE Fall Meeting, Austin, TX, 10/2/09



## What is Networking?

- Networking is the cultivating of mutually beneficial, give-and-take, win-win relationships.
- We are not dependent *on* each other; nor are we independent *of* each other; we are all interdependent *with* each other.
- Each of us has a personal sphere of influence of about 250 people. And so does every person we meet.

## What is Social Networking really?

- Social Networking is the use of technology combined with social interaction to create or co-create value.
- In a way, the definition doesn't really matter nearly as much as the application and changing role of networking relationships in a more interconnected world.

## Fast Growth

- Facebook has over 300M members and is registering 2 new users every second 24/7/365 and is valued at over \$16B
- LinkedIn has over 45M members and is registering over 600,000 new users per week and is valued at over \$1B
- Twitter is growing faster than LinkedIn and Facebook
- Over 35% of all Americans over 18 years old are active on at least one social networking platform
- Social networking is driven by User Generated Content (UGC)

## A few thoughts before exploring LinkedIn

- When technology is leveraged to facilitate and enhance social interaction, a great deal of value can be created.
- Use these new tools properly and they'll prove to be invaluable in your effort to strengthen existing relationships and capture the hearts and minds of clients and potential clients.

## Thank you!

- Kevin Knebl
- Speaker/Trainer/Coach
- Knebl Communications
- [www.kevinknebl.com](http://www.kevinknebl.com)
- [kevin@kevinknebl.com](mailto:kevin@kevinknebl.com)
- Office: 866-303-5642
- Cell: 719-650-7659



# ASFE

*Fall Meeting*

Practice Education Committee:  
Case History Search Tool  
And  
Lunch-and-Learn Updates

Vic Omelchenko, P.E.

Laura Reinbold, P.E.

*Friday, October 2, 2009*

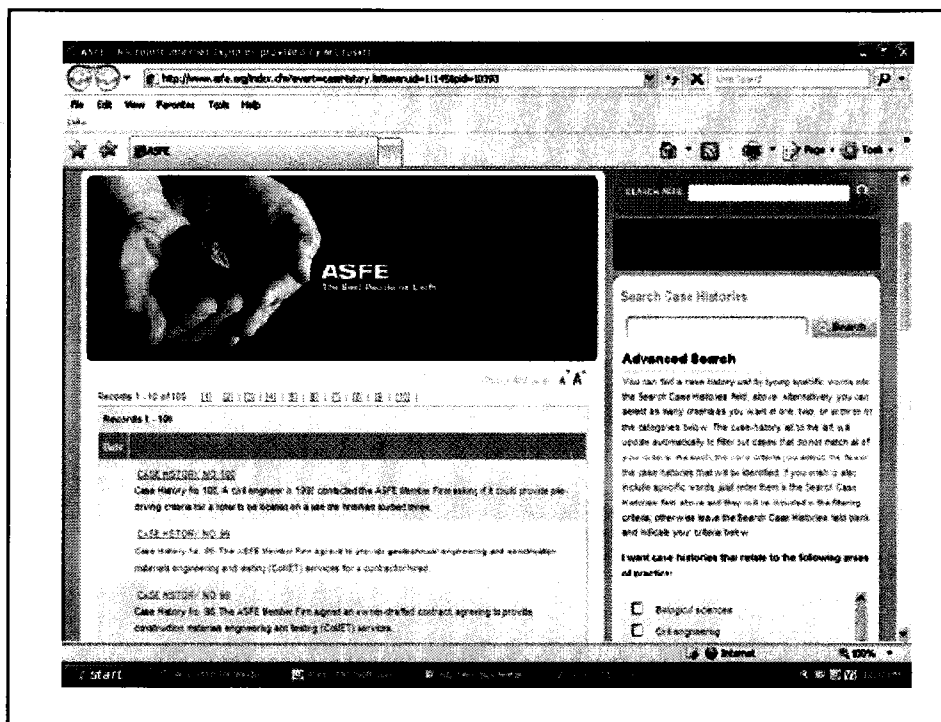
*11:00AM - 11:30AM*

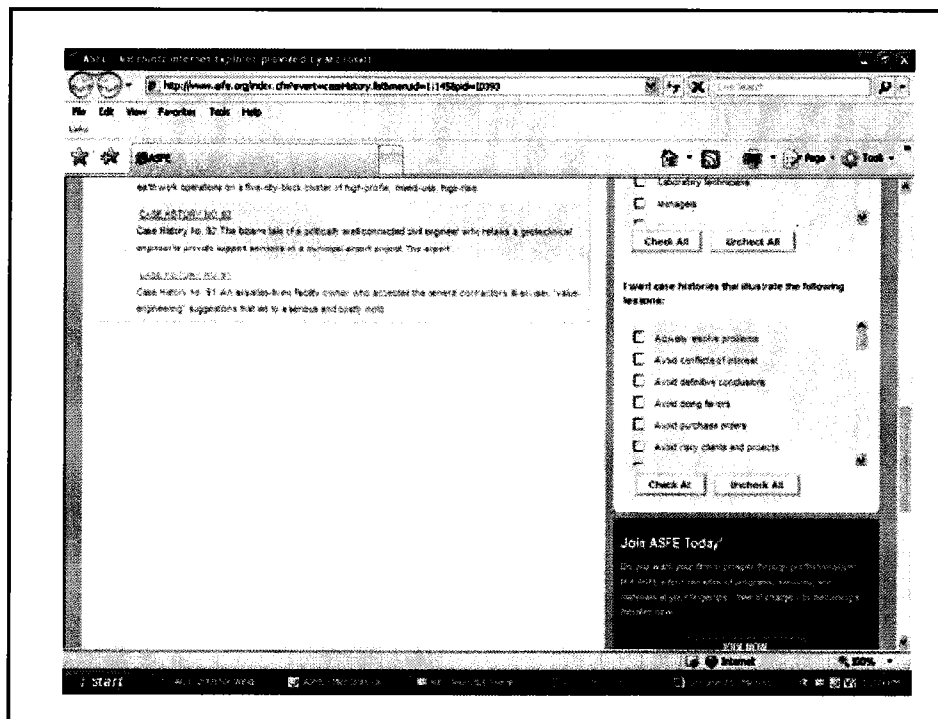
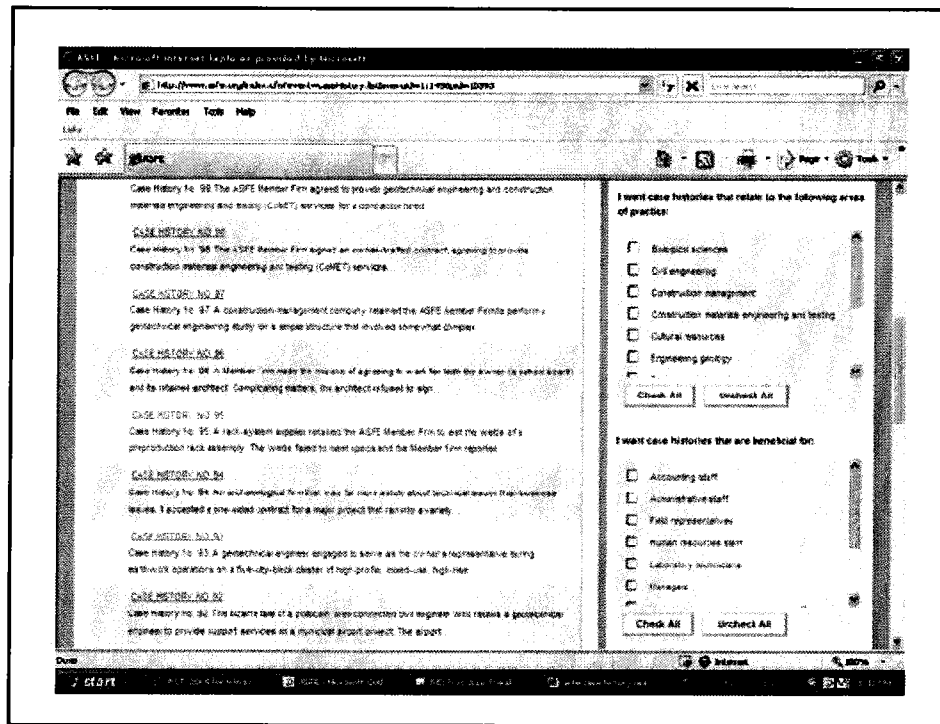


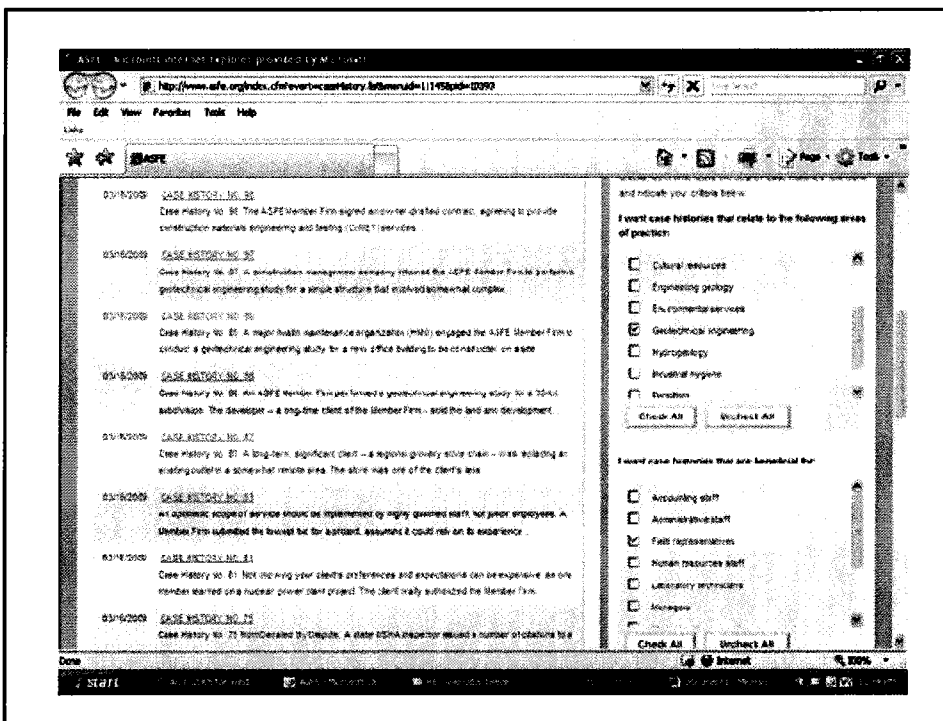
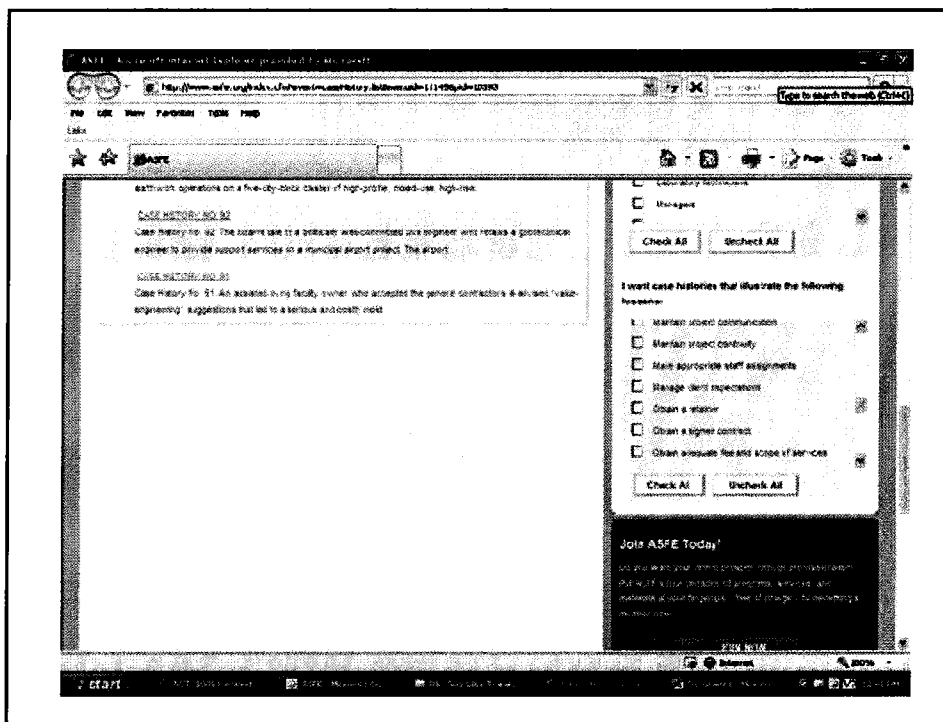
# ASFE

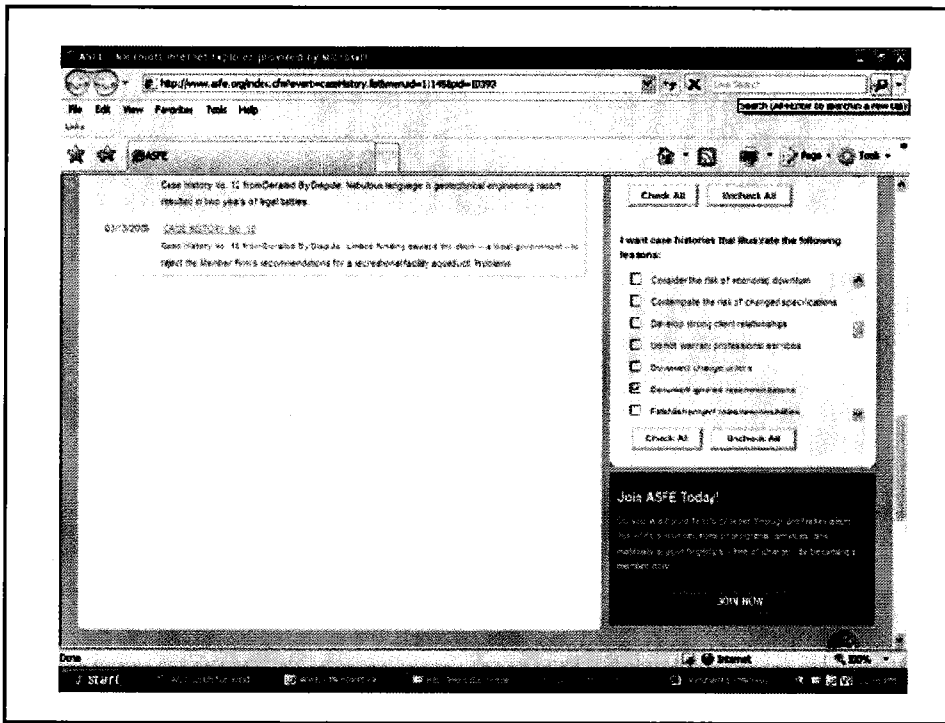
## Case History

### Search Feature

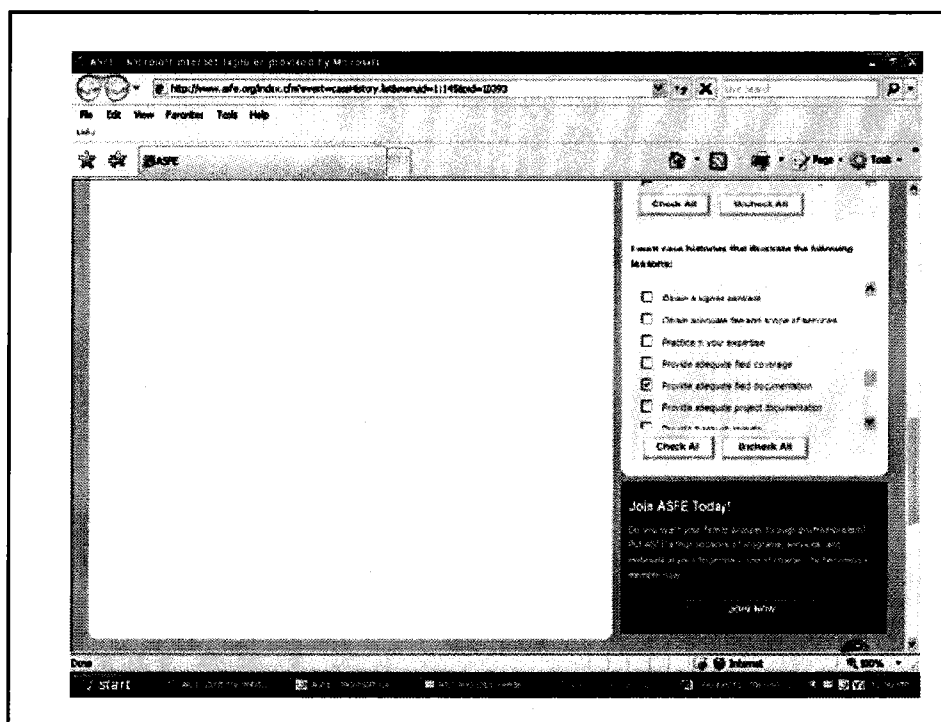
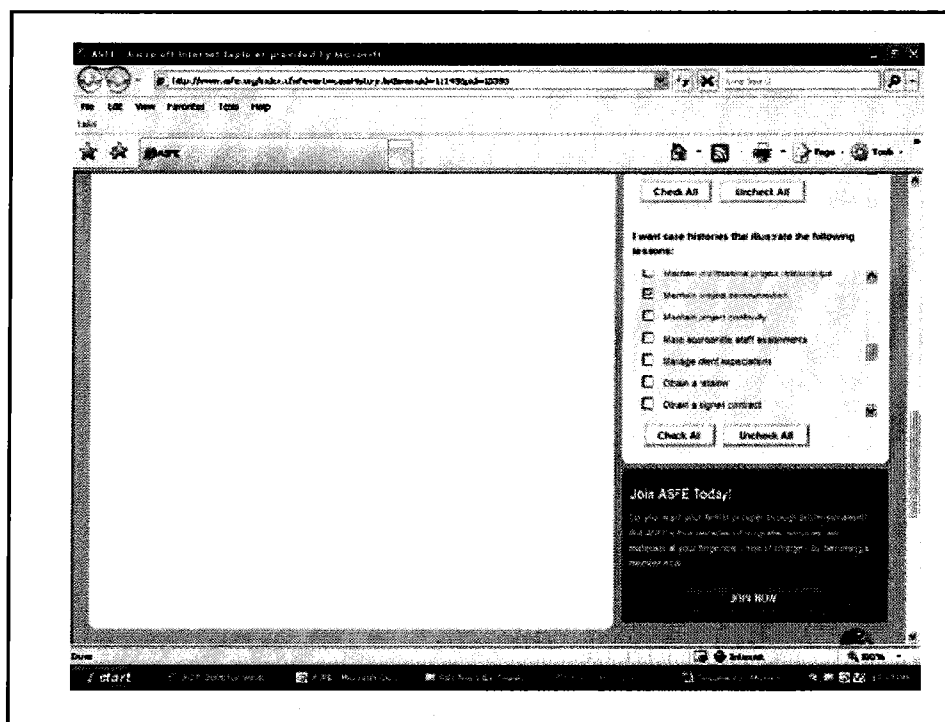


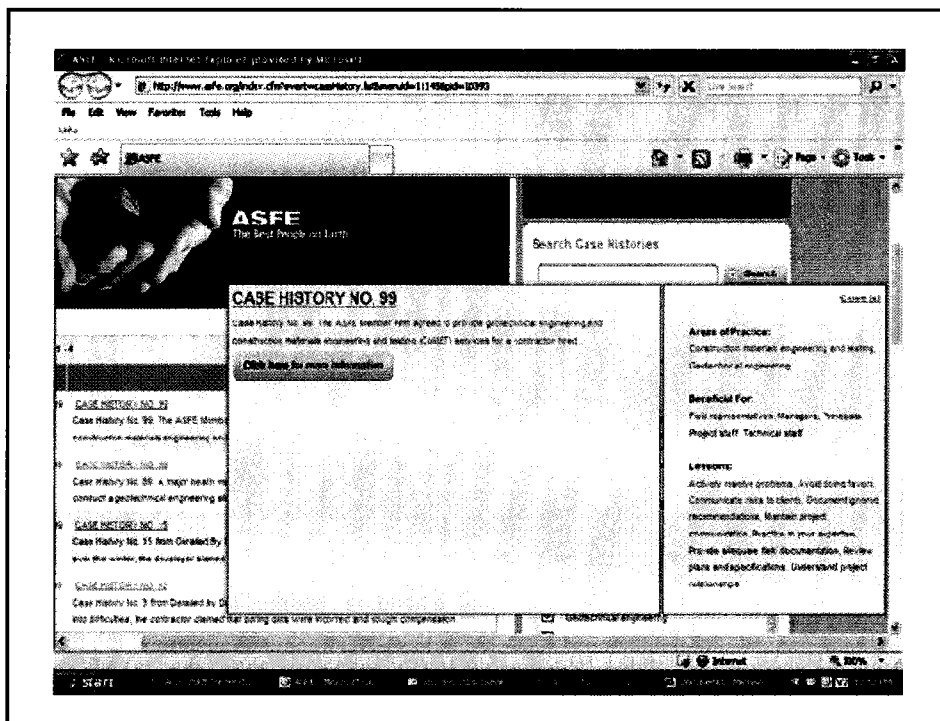
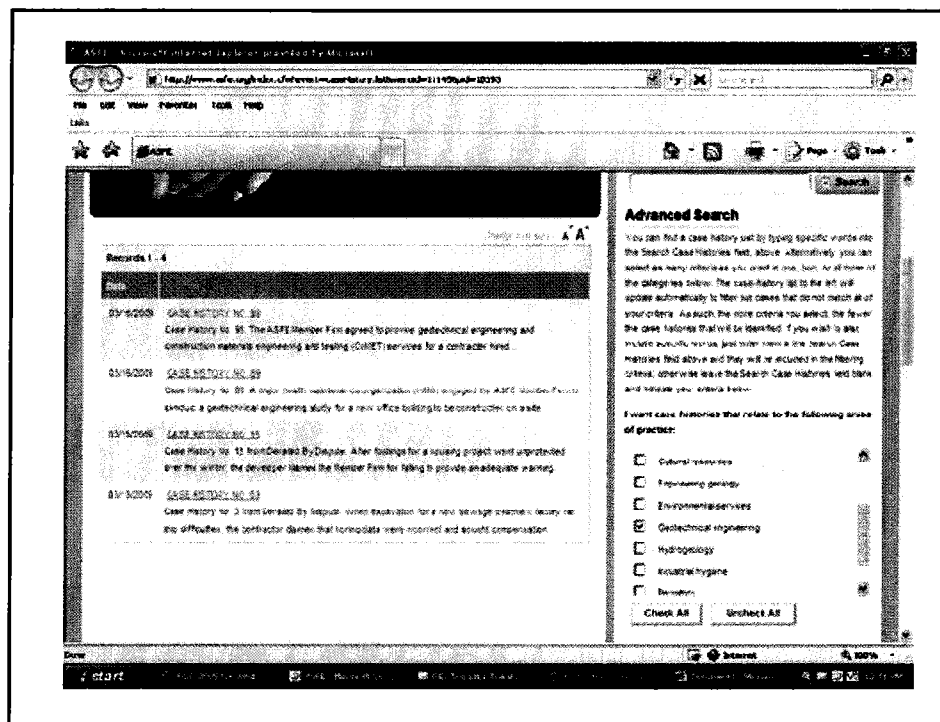


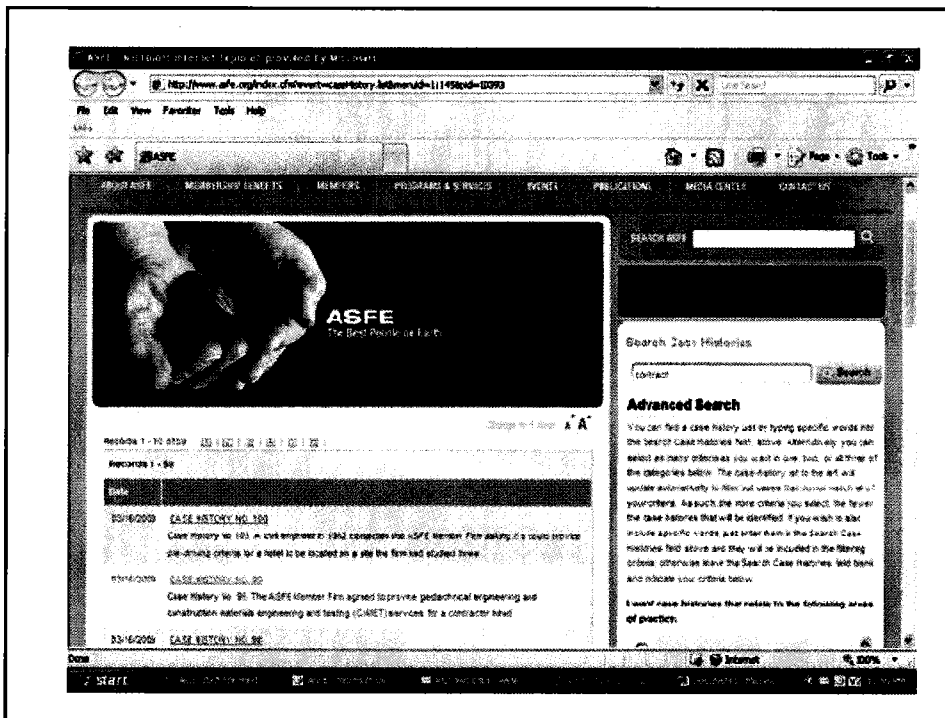
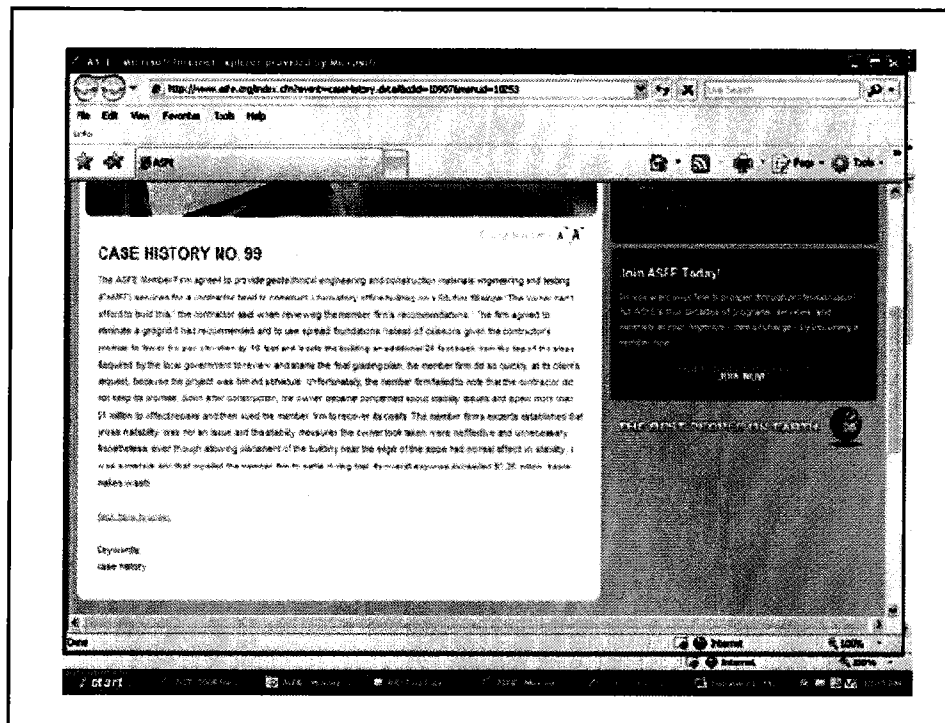




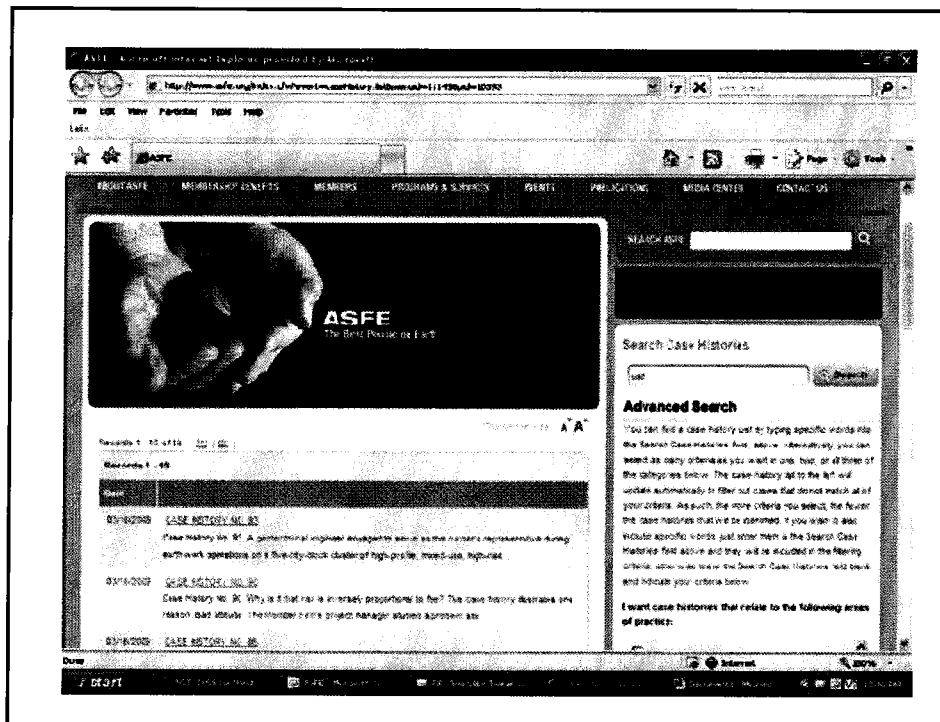
10/8/2009











# ASFE

*Fall Meeting*

## Value Pricing for Professional Services

Alan Crumley, P.E.

Joe Engels, P.E.

Gary Parks, P.E.

*Friday, October 2, 2009*

*1:00PM - 2:00PM*



## **Gary Parks**

Gary Parks worked 41 years with the Bonneville Power Administration in Vancouver Washington, managing design and planning organizations in his early career and operations and maintenance organizations from 1994 to 2007. Most recently he headed BPA's Redmond Region with responsibility for the AC and DC interties to California. Gary obtained his BS and MS degree in Civil Engineering from Oregon State University in Corvallis, OR. He is a licensed professional engineer in Oregon.

## Value-Based Compensation

Gary A. Parks, P.E., F.ASCE

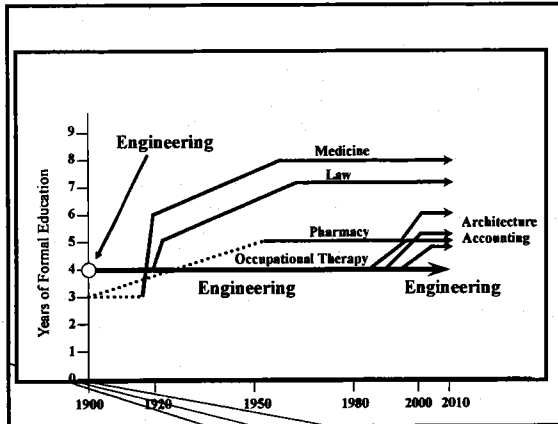
ASFE  
Austin, Texas  
October 2, 2009

## Today's Challenges

- ☐ Commoditization
- ☐ Increased Automation
- ☐ Expanding Technology
- ☐ Advanced Credentialing
- ☐ Movement Towards Additional Education
- ☐ Squeezed Profit Margins
- ☐ Predominantly Time-Based Billing

## Commoditization

- ☐ Current risk of engineering becoming a commodity
  - A "biddable" product or service, seen as routine and repeatable
  - Qualifications Based Selection (QBS) always being challenged
  - Growth of outsourcing of engineering work




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## The Situation Today

"A brutal fact of reality for architecture and engineering firms is that prevailing pricing and compensation methods - setting fees on the basis of direct labor cost (whether selling hours on a time-and-materials or lump-sum basis) - provide only minimal profits for firms."

*Design Intelligence, July 26, 2005*

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## The Situation Today

"Time-based fees also reinforce client perceptions that engineering, architecture, and design services are simply commodities to be purchased on the basis of lowest cost."

*Design Intelligence, July 26, 2005*

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## The Situation Today

"The evolution of the process for the selection and retention of Structural Engineering services has created an environment that intensifies price competition, compresses profitability, and compromises quality. New project delivery processes have exacerbated this situation."

Taking Control - A Workshop on Value Based Compensation, CASE/SEI/NCSEA, July 8, 2000

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## The Situation Today

While automation over the last forty years has dramatically reduced the amount of time required to perform most traditional engineering tasks, virtually all of these savings have been passed on to the client. No wonder then that profit margins, multipliers, and salaries in constant dollars are the same or less today than they were forty years ago.

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## The Situation Today

"The economic health of the design profession is being undermined by time-based fee structures.....Until we break the time-spent vise, we will continue to feel the squeeze on the economic benefits that our profession provides."

William F. Fanning,  
*Engineering News Record*, 1997

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### Fee Bidding

- Eliminates Mutual Scope development
- Requires the client to do considerable engineering work
- With scope established by client, design changes become more difficult
- Increases change orders
- Squeezes profit margins
- Minimizes engineering effort

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### Fee Bidding

- ASCE Policy 304 Adopted in 1987
- Federal Brooks Law
- ASCE *Manual 45* Survey Conducted in 2000
  - 20% of Service as Prime Consultant Awarded on the Basis of a Bid
  - 40% of Service as a Sub-Consultant Awarded on the Basis of a Bid

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### Minimized Engineering Effort

- Standard "One Size Fits All" Solutions
- Conservative Design
- Insufficient Attention to Life-Cycle Costs

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## Our Future

"Broadly speaking, there are only two futures for civil engineering: the one the profession creates for itself or, in the void, the one others create for civil engineering."

The Vision for Civil Engineering in 2025 - ASCE

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## The Concept of Value-Based Compensation (VBC)

- Compensation
  - Is established on the basis of the relative worth of the service to the client
  - Is based on the increased value, or savings, which the engineer's services contribute to a project
  - Recognizes some services are more "valuable" than others, particularly when such services are provided prior to basic services.

Commentary on Value-Based Compensation for Structural Engineers, CASE, 1997

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## VBC

- Rewards the engineer for
  - Originality
  - Added value
  - Increased risk
- Is not for every project or client
- Must be identified and negotiated up front

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## VBC

"Package and receive compensation for additional, up front services that we are giving away in the normal course of design. In identifying those "value services," it will be found that they will normally be outside of the usual basic services."

"For traditional, low risk work accept a relatively low mark-up, but for high risk or innovative work the markup should be higher."

Elbert C. Ray, P.E. as quoted in Commentary on Value-Based Compensation for Structural Engineers, CASE, 1997

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## Examples of Value Added Activities for a Structure

- ▶ Building site location, orientation and massing
- ▶ Decreased construction time
- ▶ Arrangement of building functions
- ▶ Foundation systems
- ▶ First cost versus long term costs
- ▶ Functional adaptability
- ▶ Sustainable design

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## Value-Added Services Beyond Basic Design

- Strategic planning
- Conceptualization
- Financing
- Commissioning
- Operation
- Maintenance

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### VBC From A Client's Perspective

- Provides:
  - ☐ Opportunity for Mutual Development of Scope of Services
  - ☐ Higher Quality Project
  - ☐ Less Costly Project
  - ☐ Fewer Change Orders
  - ☐ Basis for a Continuing Engineer/Client Relationship

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### Clients Value

- ☐ Compatibility with social, environmental, or political issues
- ☐ Compatibility with local operational and maintenance capabilities
- ☐ Adaptability for future modifications or expansions
- ☐ Low initial cost of construction
- ☐ Very high dependability (or very low risk of failure or of interrupted service)
- ☐ Minimum time to realize operational benefits
- ☐ Minimum life-cycle operating costs
- ☐ Sustainable design

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### Clients Don't Necessarily Value

- ☐ Change orders
- ☐ Delays
- ☐ Disputes and finger pointing between architect, engineer, and contractor
- ☐ The calculations engineers perform
- ☐ The fact that engineers must comply with complex codes

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"We have met the enemy and the enemy is us."

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### VBC Implementation Changing Our Thinking

- ☐ Refrain from unnecessarily conservative design or reduced scope of services due to liability and competitive concerns
- ☐ Don't accept jobs with inadequate compensation
- ☐ Don't bid for jobs or solicit bids for subcontracts
- ☐ Don't give away high value services to obtain traditional preparation of design and construction documents - receive compensation for "up front" and "back end " services
- ☐ Assign work to the proper professional

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### Levels of professional work

- Engineering Professional
  - Solutions to complex problems
  - Advanced and fundamental engineering principles
- Engineering Paraprofessional
  - Solutions to broadly defined problems
  - Widely accepted and applied procedures
- Engineering Technician
  - Solutions to well defined problems
  - Standardized processes

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## Changing Our Thinking

- ☐ Fully appreciate the value we provide
- ☐ Abandon the "one size fits all" approach to compensation for jobs of varying complexity and need for judgment
- ☐ Accept that higher-than-average profits are not unethical or unprofessional
- ☐ Accept that the risk of not providing the promised value is minimal
- ☐ Understand values important to the client at that time
- ☐ Speak the client's language

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## VBC Implementation Changing Business Approach

"Boiled down, the issue is really one of marketing. That is, perceiving a special need of the client and then being able to present a program that will meet the client's needs at a value to him that will warrant a compensation relative to the realized value."

Elbert C. Ray, P.E. as quoted in Commentary on Value-Based Compensation for Structural Engineers, CASE, 1997

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## VBC Implementation Changing Business Environment

- ☐ Educating buyers of engineering services on the value being provided
- ☐ Publishing and presenting examples of successful VBC implementation
- ☐ Working to eliminate fee and overhead caps used by many agencies
- ☐ Sharing VBC successes across disciplines
- ☐ Revising practice manuals/guidelines, i.e. ASCE's Manual 45 to include and advocate VBC

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### VBC In The Medical Profession

- Initially quite controversial (1960–1975)
- Medical specialties develop “Relative Value Guides” (RVG’s) for their specialty
- FTC alleges price-fixing
- All but Anesthesiologists (ASA) agree to consent orders to cease and desist publication of RVG’s
- Justice Dept. brings suit against ASA for violation of Sherman Antitrust Act (1975)

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### VBC In The Medical Profession

- New York District Court Judge, Kevin Duffy, rules RVG’s don’t violate antitrust laws
- George H. Bush signs Omnibus Budget Reconciliation Act establishing physician payment schedule based on resource-based relative value scale (RBRVS) (1989)
- Medicare begins basing physician payments on RBRVS (1992)

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### VBC In The Medical Profession

- Fees based upon relative value of every procedure (Relative Value Guide, RVG)
- Fee considers three components – physician work, physician expense, professional liability insurance
- Physician work includes:
  - Time to perform service
  - Technical skill and physical effort
  - Required mental effort and judgment
  - Stress due to potential risk to the patient

Resource-Based Relative Value Scale,  
AMA, January, 2008

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**"Destiny is not a matter of chance; it is a matter of choice."**  
 -- Statesman William Jennings Bryan

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**VBC**

- ☐ Not for every job
- ☐ Not for every client
- ☐ Must be identified and negotiated up front
- ☐ Requires the engineer to communicate values in language the client can relate to and appreciate
- ☐ Shouldn't be confused with lump sum

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**Are You Ready For VBC?**

- ☐ Hold an internal discussion to verify that your firm is comfortable with the concept of VBC.
- ☐ Learn how other industries and firms use VBC.
- ☐ Begin with clients with whom you already have a strong relationship.
- ☐ Watch for unique circumstances.

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*Fall Meeting*

Client-Focused Contract  
Negotiations

Michael Yost, Esq.

*Friday, October 2, 2009*  
*2:15PM - 3:00PM*



## Client-Focused Contract Negotiations

### How Thinking Like a Client Can Result in Negotiating Success

**Mike Yost**  
VP/General Counsel – Terracon Consultants, Inc.  
Chair, ASFE Legal Affairs Committee

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## Topics Covered

- Negotiating
  - When, How, and Client Focused
- Specific Terms
  - Scope of Work
  - Standard of Care
  - Warranties
  - Indemnity
  - Waiver of Consequential Damages
  - Limitation of Liability



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## When to Negotiate

- The BEST time to allocate risk is before you do the work.
- The last good time to allocate risk is before the Client receives the report.
- If you don't have a signed contract with good terms before the Client gets the report, your contract terms will be less favorable.

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## How to Negotiate

Two Primary Factors:

- What you are willing to give
- What your Client is willing to take

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## How to Negotiate

- Negotiations are faster when you focus on what you are willing to give
- Negotiations are more effective when you focus on:
  - what you can get your Client to accept.
  - why they should take it.

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## How to Negotiate

- Appeal to fairness 
- Appeal to logic 
- Appeal to Client's self-interests 

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## Client Focus: Think Like a Client!

- Clients don't care about your risk.
- Most Clients don't care about fairness or logic – viewed as defensive.
- Clients care about contracts provisions to the extent they impact them.
- Use talking points that appeal to the Client's interests, not yours
- What's in it for them?



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## General Negotiation Points

1. Think of the issue through your Client's eyes. Then view your role as the problem-solver.
2. Conversations about contract terms do not need to be confrontational or adversarial. Don't take the negotiation personally or show negative emotions.
3. Know what points are most important and be able to explain why.
4. Highlight your value – your experience, knowledge, and professionalism.

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## Scope of Work

- Did the Client's contract incorporate your proposal, or use their own language?
- Can you do what the Client's scope committed us to do?
- Do you need to clarify or expand?
- Has the Client incorporated plans and specs you've never seen?

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## Scope of Work –Talking Points

### "Why All This CYA Language?"

- Revising for accuracy – not CYA
- In Client's best interest:
  - Clients are fearful of change orders:
    - Makes it harder for you to justify unintended change orders.
    - Helps owner defend against contractor change orders.
  - Doesn't give contractor an "out" for failing to meet specs .



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## Warranty Language:

- Professionals are NOT insured to provide a warranty.
  - Basically takes an insured claim and makes it uninsured by including words like
 

"guarantee"	"free from defects"	"expertise"
"warranty"	"highest"	"best"

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## Warranty What?

- I guarantee that I will follow the standard of care...
- I warrant that I will follow the terms of this contractual agreement.
- It's not the term "warranty" or "guarantee" that get you into trouble, it's the words after.
- Key is to watch for those words to see if they lead to the bad language.

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## Warranties – Talking Points

### “Why Won’t You Stand Behind Your Work?”

- You are providing professional engineering services and the Client’s language is not applicable.
- Think of your contract like a contract your doctor would sign:
  - Does your doctor guarantee you’ll get better, you will not get sick for a year, that every doctor in the city would give you the exact same medication?
- Does that mean your doctor doesn’t stand behind the diagnosis?



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## Warranties – Talking Points

### “Why Won’t You Stand Behind Your Work?”

- Warranty provisions have nothing to do with standing by your work.
- Use this opportunity to sell your Client service and responsiveness.

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## A Phrase To Memorize...

“This provision could cause our insurance company to deny coverage, and neither you nor I want that...”



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## A Phrase To Memorize...

"and neither you nor I want that."

- It doesn't matter to the Client if you want it.
- It matters that it is not in the Client's interest for us not to have insurance.
- Pursue the discussion based on their concerns, not yours!

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## Indemnity

- Three types of indemnity
  - Type I: covers Client's negligence, even if you did nothing wrong (liable for 100% even if 0% negligent)
  - Type II: covers Client's negligence, even if you were both partially at fault (liable for 100% if 1% or more negligent)
  - Type III: covers only your negligence (liable only for % negligent)
- Type I and II not covered

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## Indemnity Examples

- Consultant agrees to defend, indemnify and hold harmless Client, its directors, employees, and agents from and against any and all liability directly or indirectly related to Consultant's performance of the work
  - Type I: even if caused solely by Client.
  - Type II: Unless caused solely by Client.

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## Indemnity Examples

- Consultant agrees to indemnify and hold harmless Client, its directors, and employees, from and against any and all liability to the extent caused by Consultant's negligent performance of the work.

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## Indemnity – Talking Points

"Does this mean you won't pay for your mistakes?"

- "We'll pay for our mistakes, but we shouldn't have to pay for other's mistakes. We are not an insurance company."



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## Our Phrase To Memorize...

"This provision could cause our insurance company to deny coverage, and neither you nor I want that..."



Terracon

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## Consequential Damages

- Typically meant to refer to indirect damages.
  - Prime Example is Lost Profits
- Legally Responsible unless contracted away.
- Often disproportionately large.

Terracon

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## Consequential Damages – Talking Points

- These damages are unforeseeable & cannot protect against them.
- We have little/no control over any scheduling issues that affect these damages.



Terracon

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## Consequential Damages – Talking Points

- Industry standard in the services industry that the service provider is not liable for these types of damages.
- This is a mutual waiver clause – each party waives these damages. (Used to dealing with contractors).
- Clients are fearful of change orders – use this to your advantage.



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## Limitation of Liability

- Caps Overall Liability
  - Only to other party signing the contract
- Disfavored by Some Courts
  - Requires clear evidence of intent

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## LOL – Talking Points (cont'd)

- Evaluation of risk and reward.
- Uncertainty of the nature of our business, with the Client's limited scope of our work.
- Clients are unwilling to pay for the work it would take to increase the level of certainty in our work.
- Fees we charge assume that we are able to limit our total liability in this manner.
- Be able to explain your role in the project.



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## LOL – Talking Points (cont'd)

- Clients limit their liability too – use LLC per project.



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## LOL – Talking Points

- **BE WILLING TO EXCLUDE FROM THE LOL DAMAGES COVERED BY GENERAL LIABILITY INSURANCE.**
- For higher LOL amounts – LOL will cover most damage scenarios.



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## “Firm X Will Sign This...”

- Client wants to hire you or you wouldn't be talking.
- They don't want to go to the trouble of going somewhere else.
- **LEVERAGE THESE POINTS!!**
- Contrast your value against theirs.



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## “Firm X Will Sign This...”

- “If the consultant isn't paying attention to the details of their own business, will they pay attention to the details of yours?” (By contrast, we're looking at these issues for both you and us.)
- For high LOLs: “No LOL is really a LOL to whatever insurance they are giving you, assuming it's available to you when you need it.”



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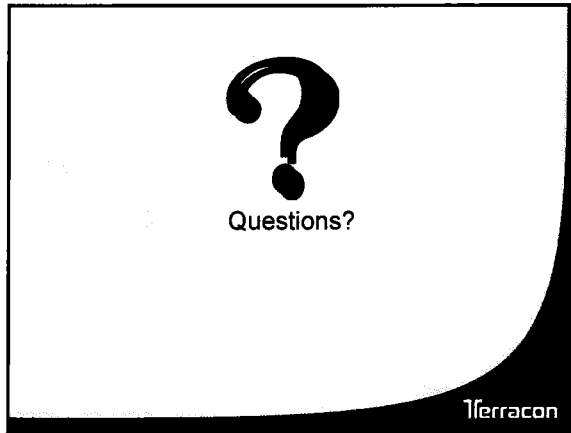
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# ASFE

*Fall Meeting*

Laboratory Accreditation –  
It's Not an Option

Leo Titus, P.E.

*Friday, October 2, 2009*  
*3:00PM – 3:30PM*



# ASFE

*Fall Meeting*

## Evolving Your Approach to Business Strategy through Scenario Planning

Susan Harris, Ph.D.

*Saturday, October 3, 2009*  
*8:30AM - 10:30AM*



**Susan L. Harris, PhD**  
**Owner & Principal Consultant**  
**Leadership & Strategy for Sustainable Systems**

Since the early 90's, Susan Harris has pioneered state-of-the-art leadership, strategy, and organization development for architecture and engineering firms. She brings 28 years of experience as a manager and consultant in the private, public, and nonprofit sectors to helping firms become learning organizations capable of responding resiliently to chaos and complexity. Dr. Harris developed and taught Leadership, Facilitation for Project Managers, and other core courses at the Advanced Management Institute for Architecture and Engineering in San Francisco for 14 years. She also served as principal architect and anchor faculty for the Senior Executives Institute program offered by AMI in collaboration with ACEC and the Brookings Institution in Washington, D.C., and still teaches in the program. In 2005 with her colleague Kyle V. Davy, Dr. Harris published *Value Redesigned: New Models for Professional Practice*, a comprehensive blueprint for transforming the A&E industry for the 21st century. She was an Editor of the journal of the Bay Area Organization Development Network for 10 years, is a long-time member of the World Future Society, and holds a Ph.D. in English from the University of California at Berkeley.



ASFE Fall Meeting, October 3, 2009  
Austin, Texas

## Evolving Your Approach to Business Strategy Through Scenario Planning

Presented by  
Susan L. Harris, PhD  
Leadership & Strategy for Sustainable Systems

### Some warm-up questions



- How many of you believe we are in “just another business cycle”?
- How many think there are some things that will be enduringly different this time around?
- How many feel like planning is futile today because things are just too unpredictable and changing too quickly?
- How many believe you will need to do something different with your strategic planning processes than you have in the past in order to address our current and future challenges?

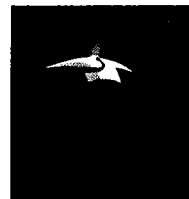
## Over the next 2 hours, I'll...

- Present a formal strategic planning framework that is robust for turbulence & rapid change, including:
  - ✓ Guidelines from lessons learned
  - ✓ A rigorous process for strategy implementation
- Introduce scenario planning
- Lead you through a scenario thinking process:
  - ✓ Sketch four "macro" scenarios for the next 3-5 years
  - ✓ Discuss what general strategies make sense in these scenarios for large, medium, & small firms
  - ✓ Test goals you're considering to position for the post-recession environment against these scenarios
- Summarize how to integrate scenario thinking into your strategic planning & ongoing strategic thinking



## Why plan?

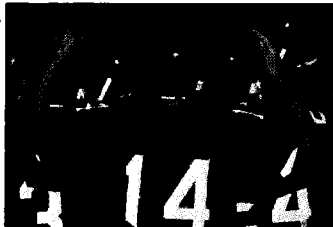
- How many of you would say that you have been satisfied with your strategic plans in the past?
- How many of you who have **not** been satisfied would say that the problem was more with the implementation than with the plan or the planning?



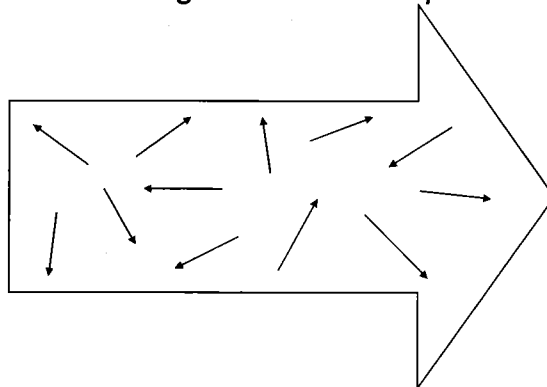
## Eisenhower's famous statement

**“Plans are worthless, but planning is essential”**

- Why do you think he arrived at this conclusion?



Importance of alignment  
from “Team Learning” chapter  
of Peter Senge’s *The 5th Discipline*



What is the net effect of all these forces?



## Evolution of strategic planning from the late 1960s to the present



From...	To...
Exclusive analyst function	Broad staff participation
Prediction & extrapolation	Acknowledged uncertainty
Detailed plans	Values, vision & strategic goals
Periodic event	Ongoing thought process

## Framework that has worked best for me is based on formal planning every 3 years

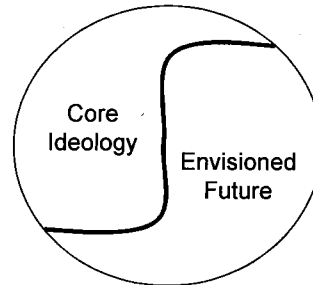
- **“Built to Last” model for “Vision”**  
(constantly communicated, but rarely changed)
- **Mission**--the business(es) you're in (revisited as needed)
- **3-year Strategic Goals** that link Mission to Vision
- **Implementation process** based on:
  - ✓ Clear definition of individuals/groups responsible for each 3-year Strategic Goal &
  - ✓ Annual goals for each staff member that are aligned with & integrated to achieve the



## VISION: as an organization, who you are & what you want to do

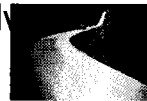
Jim Collins & Jerry Porras  
articulated a new model for  
developing vision in *Built to  
Last* (1994)

- “core ideology” = what  
doesn't change (the yin)
  - ✓ core purpose + core  
values
- “envisioned future” =  
what changes (the yang)
  - ✓ BHAG (20-30 year goal)  
+ vivid description



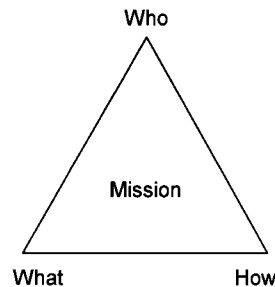
## “Built to Last” model challenges & lessons

- Articulate core purpose at a more general  
level than the business you are in now in a  
way that supports your ability to evolve
- Limit your core values to 5
- Put enough stretch into your envisioned  
future: requires the “gulp factor,” only a 50%  
chance of achievement
- Strive for the singularity of a BHAG, but don't  
abandon the model if you can't get there; a  
good vivid description with several stretch  
aspirations can work



## Mission

- Defining the business(es) you're in provides necessary boundaries for pursuing your envisioned future
- Mission = three key elements of your business model:
  - WHO - your client/customer
  - WHAT - product, service, experience or other outcome you're providing
  - HOW - how, in general you're providing that



## 3-year Strategic Goals

- Define your strategy for the next 3 years
- Do double duty as measurable goals for that period
- 7 is an absolute maximum; 5 or even 3 is better
- Should focus principally on how you are evolving your relationship with your clients, markets, & business ecosystems, but may also need to include internally focused goals
- Must be communicated continuously
- May need to be adjusted before the next formal strategic planning event if the environment changes significantly



### 3-year Strategic Goals key challenge



- In effort to focus on new directions & change, firms have often created unintended tension with need to maintain a healthy top & bottom line
- In challenging times, leaders emphasize utilization, project management, collections rather than strategic goals
- Perceived by staff as lack of commitment to strategy
- Staff lower priority of or drop strategic actions they're responsible for, especially if rewards tied solely to \$
- As strategic progress slows, credibility in strategic planning degrades
- In next planning cycle, even harder to inspire & engage the skeptics

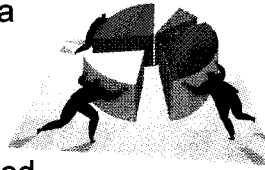
### 3-year Strategic Goals lessons learned

- Don't allow this either/or to be present in the first place: your 3-year Strategic Goals should include the **both/and** of new directions **and** basic financial health
- Sometimes priorities will need to be shifted for a period of time: this should be done mutually & explicitly with staff in the context of all strategic goals
- Firm leaders need to get better at recognizing where priorities are actually competing or not & then communicating that
- It is possible to stay in the **both/and** more often than staff believe: they often need help in understanding how doing something new can actually bring in more revenue or generate more profit



## Clear responsibilities for Strategic Goals

- In a small firm, a person may be responsible for a Strategic Goal
- But even in a small firm, it may be difficult for any one person or even group to be wholly responsible for a given goal
- Strategic Goals are typically interrelated & interdependencies must be acknowledged & understood
- Defining clear accountabilities requires extensive conversation among individuals responsible for the different Strategic Goals



## Annual goals for all staff aligned with 3-year Strategic Goals



- This comes back to the importance of alignment—you need everybody pulling in the same direction
- Annual goals tied to performance evaluation, promotion, & compensation are key to building accountability for strategic progress (yes, reward system needs to align)
- Regular progress checks provide the forum for performance feedback & ongoing strategic conversation
- If market environment changes significantly, annual goals must be modified
- Strategic conversation about & modifications of annual goals form the basis for reconsideration of

### A few more process considerations

- Do have your most strategic thinkers do the core work
- Include strategic thinkers from more junior ranks & across business lines
- Do provide means of gathering input from everybody in the organization—through process as rapid & real-time as possible
- Do feed ongoing course-correction with ongoing strategic thinking & conversation—not only inside your firm, but **with your clients**



### Self-reflection & brief pair discussion

- How many of you feel that you regularly conduct strategic conversations inside your firm?
- When & how do those tend to take place?
- How about with your clients?
- What do these conversations with clients sound like?
- How often do these conversations lead to course-correction in your strategic direction?



## Let's shift now to scenario planning...

- What types of strategic challenges have your plans taken on in the past?
- How would the list be different for the challenges you face now?
- Would you characterize the business environment you're in as rapidly changing?
- Would you say that your form of consulting engineering is being impacted by disruptive technology?
- Would you characterize it as more predictable or more uncertain?
- How many of your firms have used "scenario planning" in the past?



## The discipline of scenario planning

- Purpose: provides a means of planning in a world of uncertainty & rapid change
- Importance: enables us to develop "memory of the future"\*--literally the ability to perceive things that we have not yet seen

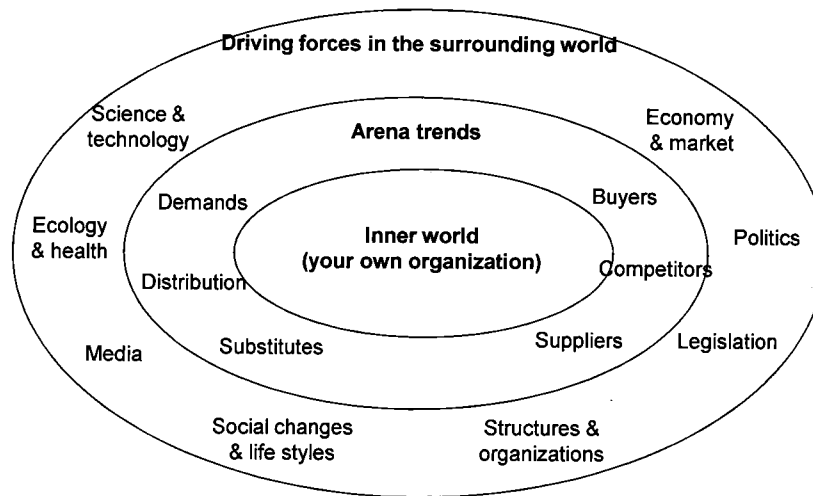
\*Arie de Geus,  
*The Living Company*



- Definition: imagining alternative futures based on critical uncertainties surfaced by rigorous trend analysis

## A framework for thinking about trends

Lindgren & Bandhold, Scenario Planning (2009), p. 60



### *Chaotics: The Business of Managing & Marketing in the Age of Turbulence (Caslione & Kotler)*



After the financial meltdown is over, operations can't revert to business as usual. Organizations will have to make the following 4 changes:

- 1) Recognize a new normality, which is a constant state of change & turbulence
- 2) Implement scenario planning & early warning systems
- 3) Expand their stakeholder base
- 4) Execute initiatives in shorter intervals & sideways rather than always moving forward

*Caslione claims "fewer than 10% of organizations currently are engaged in scenario planning."*



## 7 key success factors in turbulent business environments\*



Lindgren & Bandhold, Scenario Planning: The Link Between Future & Strategy (revised & updated, 2009), p. 104.

## Major steps of scenario planning

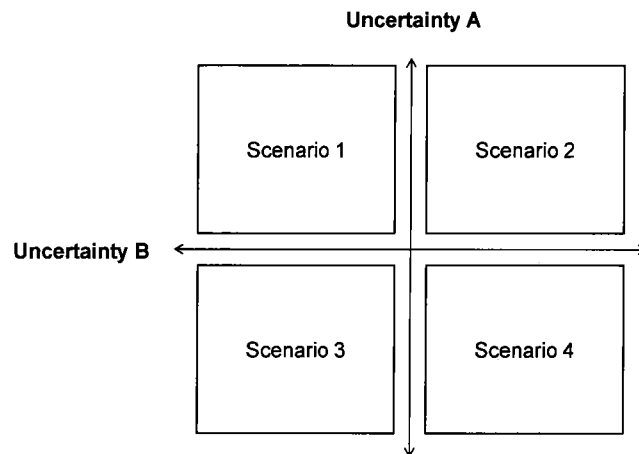
- 1) Identify & clarify the key strategic decision
- 2) Identify key factors influencing decision
- 3) Identify driving forces influencing key factors (gather information about local & global trends)
- 4) Rank driving forces by importance & uncertainty to identify key predetermined elements & critical uncertainties
- 5) Select scenario logics based on critical uncertainties
- 6) Write narratives of different scenarios
- 7) Evaluate success of decision across scenarios & modify decision as needed
- 8) Select leading indicators



Based on Peter Schwartz, *Art of the Long View*

## Scenario cross

Lindgren & Bandhold, Scenario Planning (2009), p. 72



## Evolution since the 1990's

- Process popularized by Schwartz focuses on answering a specific strategic question: should we move in direction x?
- Enables you to test the robustness of direction x across a variety of scenarios & to identify “early warning” signals
- Since then, use of scenario methods has expanded into every part of strategic planning:
  - 1) Analysis of long-term market context to provide basis for Visioning. This use has led to branch of scenario planning that creates desired futures rather than just possible ones
  - 2) Development—not just evaluation—of strategic options
  - 3) Development & evaluation of implementation approaches
  - 4) Adjusting implementation or strategy for course-correction
  - 5) Navigating crises in the moment



Why, in my observation, few A/E firms  
have used scenario planning to a  
significant degree for any of these  
purposes

- It takes time & quite a bit of research on trends unfolding in the present
- It takes a different kind of imagination
- It seems alien to habits of mind oriented to thinking in “high probability” rather than just “possibility”

*I'd like to suggest that it is possible to build **scenario thinking** both into your formal strategic planning processes & your ongoing strategic thinking without having to invest in extensive research.*



Steps for doing some 3-year scenario  
thinking for soil & foundation engineering

- 1) What things are you pretty sure are going to be true as we come out of the recession? (Predetermined elements.)
- 2) What do you believe are critical uncertainties?
- 3) Identify the 2 most important critical uncertainties
- 4) Determine whether the 4 basic combinations of these uncertainties work & adjust as necessary
- 5) Develop logic for 4 scenarios based on critical uncertainty combinations & predetermined elements
- 6) Thinking like your clients, determine what general strategic direction makes sense for each scenario
  - For a large firm? For a small-medium firm?



## Possible predetermined elements

- Largest generation of teenagers in global history coming into their childbearing years
- Continuing migration of global population out of rural areas into megacities
- More global demand for limited resources, including everything from water and food to building materials like steel to essential minerals such as lithium for batteries
- Inability of affordable fossil fuels to keep pace with increased global demand for energy
- Increasing investment in alternative energy
- Increasing number of infrastructure failures—bridges, power grid, etc.



## Possible predetermined elements, cont.

- Increasing need for environmental remediation & restoration
- Increasing regulation & emphasis on meeting sustainability-related goals
- Baby Boomers retiring in increasing numbers
- Life span continuing to increase
- Accelerating advances in biotechnology & nanotechnology
- Increasing individual access to information & communication media
- Increasingly competitive global business environment



## Possible critical uncertainties



- How soon & how robustly the economy (& our collective psyche) will “recover”
- How long it takes for credit to flow freely again for construction projects
- Whether other countries will continue to buy U.S. bonds
- How many Federal \$ will be available & allocated for large-scale infrastructure projects
- How soon & how much will State budgets begin to rebound
- When/if hyperinflation will kick in
- How quickly & aggressively the U.S. will move to reduce carbon emissions

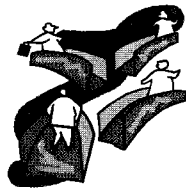
## Possible critical uncertainties, cont



- How much reconstruction will be required in order to recover from potentially increasing acts of terrorism & natural disasters?
- Whether immigration will be allowed to continue at recent elevated rates
- Whether polarization of political & cultural opinion will continue to increase
- Whether the current flight from expensive, sunny states (CA & FL) will continue
- Whether there will be enough engineers with requisite technical skills

## What general strategic direction makes sense in these various scenarios?

- Put yourself in the minds of your clients: what kinds of strategic challenges are these scenarios placing in front of them
- Working in pairs or triads, let's think first about a large firm:
  - ✓ Scenario 1
  - ✓ Scenario 2
  - ✓ Scenario 3
  - ✓ Scenario 4
- Does this differ for a small or medium firm?



## Using scenarios to evaluate a strategic goal

- Turn to the person next to you and share strategic goals you are considering to position your firms for the post-recession marketplace
- Test these goals against the 4 scenarios we have developed
- Prepare to share highlights of what you learn
- Results for large, medium, & small firms



## Summary of scenario exercise

- We've explored a simple form of scenario thinking that consists of:
  - ✓ Thinking explicitly about trends you're pretty sure will continue in the time period you're looking at
  - ✓ Asking "what if" two critical uncertainties you see in your market environment (macro or micro) show up in various combinations
- This form of scenario thinking is useful for:
  - ✓ Developing strategies & testing strategic goals during formal strategic planning
  - ✓ Modifying goals during implementation



## Summary of scenario exercise, cont.

- To support this form of scenario thinking, I recommend that you:
  - 1) Build formal or informal processes for scanning the environment for trends & "weak signals" that tell you when a particular scenario might be materializing, or when a trend seems to be shifting
  - 2) Conduct regular strategic conversations—both internally and with your clients—that check in on what you are learning from your environmental scanning and include scenario thinking based on that scanning



## Conclusion

- In challenging times, planning becomes more, not less necessary
- Though you will need to adjust frequently, you need everybody to be able to adjust together
- You need to develop real alignment through more effective formal strategic planning--& I do recommend my 4-part framework
- And you need to build ongoing processes for monitoring progress that form the backbone both for accountability & for ongoing strategic conversation—about what staff are sensing in clients & the marketplace, about emerging signals & trends, & about course-correction



## Conclusion, cont.



- Scenario thinking is a discipline that you can learn & get better at over time
- It can take your readiness to deal with rapid changes in your business environment to a completely different level if you practice it consistently
- Given the sustained turbulence that most observers expect in the coming years, I hope you will agree that it is worth your while to begin incorporating it into your formal strategic planning & your ongoing informal processes of strategic thinking & strategic conversation
- Thank you very much for your attention & engagement!



# ASFE

*Fall Meeting*

Business Roundtable Sessions

*Saturday, October 3, 2009*  
*10:45AM - 12:30PM*



# ASFE


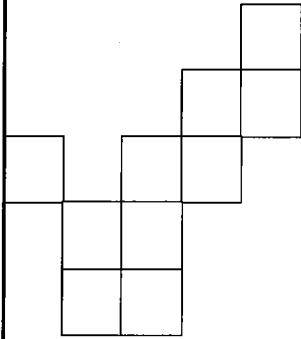
*Fall Meeting*

CoMET Committee Luncheon

Jeffry Cannon  
&  
Elizabeth Levi

*Saturday, October 3, 2009*  
*12:30PM - 1:45PM*








## CoMET – Commodity or Value?

Elizabeth Levi, Pleasanton, CA  
Branch Manager

Jeffrey Cannon, Technical Discipline  
Leader, CoMET Services



## Agenda

- How to sell the true value of CoMET services
- How to get your clients to recognize the true value



## Definitions

### Commodity

- A widely available good or service that is not substantially different, and typically diminishes the importance of factors other than price.

### Value

- A fair return in goods, services, or money for something exchanged. The monetary worth of something.



## Connoisseur

- Easily discerns value and will likely pay more for superior value.
- Non-Connoisseurs will often look for price to be the deciding factor.



## Creating Value

### ■ Clients want:

- Strong leadership
- Dependability
- Team players
- Good accounting systems
- Consistency
- One-stop full-service

### ■ Focus on client goals and the big picture

- Schedule
- Budget
- Proactive solutions
- Regulatory compliance



## Remove Distracters

- Eliminate reasons for your client to **NOT** use you
  - Frequent personnel changes
  - Confusing or inaccurate invoices
  - Missed deadlines
  - Not following specs and standards
  - Poorly defined or understood scopes of work
  - Not being responsive timely
  - Not honest about capabilities and experience
  - Providing multiple variations of reports and services





## **Choose Your Clients & Projects**

- **You choose**
- **Fit your unique capabilities to the client's needs**
- **Walk away from clients you cannot provide superior value to**
- **Focus on market sectors**
  - **By service type**
  - **By client type**
  - **By location**
  - **By other**



## **Be Different**

- **Don't try to imitate your competitors**
- **Set yourself apart from the pack**
- **More different and diverse = Greater opportunity to set your own price**
- **Follow up on mistakes**
- **Maintain accreditations and certifications**



## **Deliver on Your Promises**

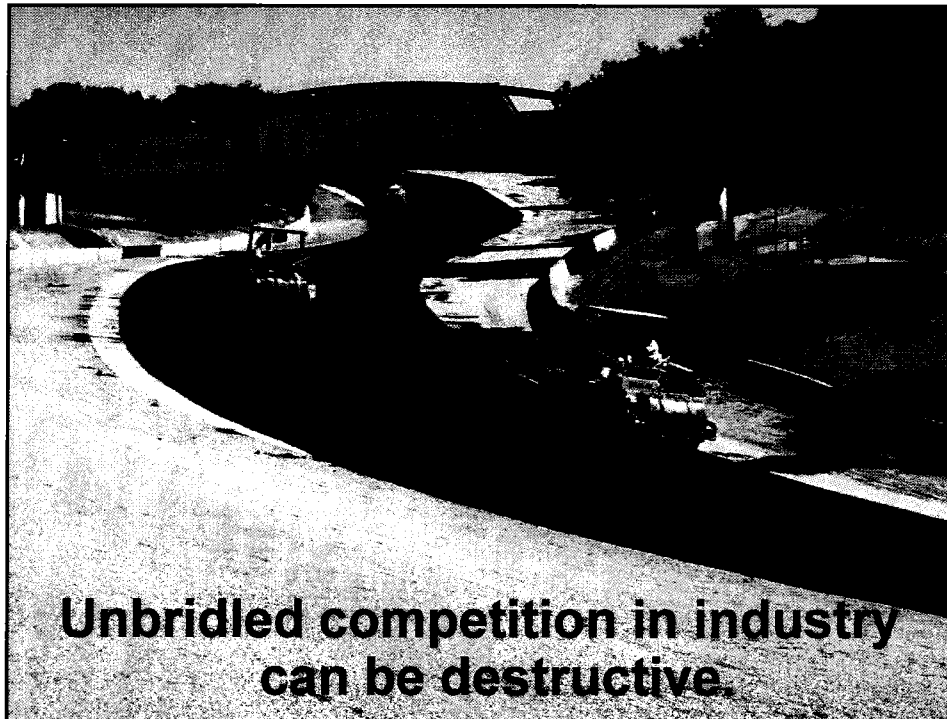
- **Have a well defined scope of work**
- **Explain your role and responsibilities, and how you can help keep the project on schedule and budget**
- **Demand to be included in regular project meetings**
- **Reinforce that you are part of the team**





## Pricing

- Price your services according to the value you provide
- Focus on the reason for your price
- Some services are more valuable than others



**Unbridled competition in industry  
can be destructive.**



## **Be Visible**

- **Engage your client, contractors, others**
- **Senior people visit project sites**
- **Encourage client visits to your office and lab**



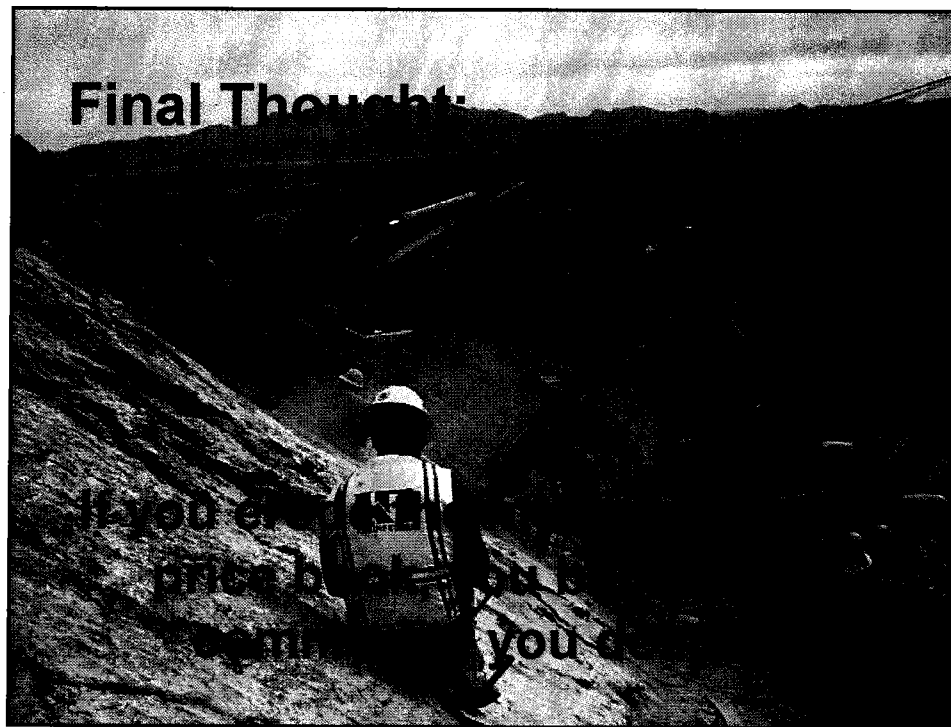
## **1<sup>st</sup> Impressions**

- **Field representative attire**
- **Professional attitude**
- **Reporting**
- **On time**
- **Equipment**



## **Conclusion**

- **Be courageous**
- **Proactively seek ways to:**
  - ☐ **Create value**
  - ☐ **Differentiate yourself from the competition**
  - ☐ **Demonstrate and communicate your value**
  - ☐ **Increase value to clients without lowering prices**
  - ☐ **Practice what you preach, and demand your staff do the same**



**ASFE**  
The Best People on Earth

# Questions?

Thank you!