Transforming America’s Infrastructure with Science and Technology

Briefing and Demonstration on Digital Modeling, Simulation and Other Cutting Edge Technologies
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Good Afternoon!

Thank you very much for participating in this very important meeting to "Transform America's Infrastructure with Science and Technology."

Your involvement and shared perspective will provide valuable insight into how we can utilize America's technology expertise to revolutionize our infrastructure and construction industries, and create value and opportunity for our citizens.

Today, we begin a process to reshape and enlighten our approach to meeting our nation's fundamental needs for transportation, infrastructure and buildings, and the systems that support them. A critical element of our nationally-significant initiative begins with applying Digital Project Simulation to transportation projects in New York, Alaska, and Washington.

When we are successful, we can achieve three important outcomes:

1. Stimulate the process to rebuild a better New Orleans, using technology, for less money than a traditional approach.

2. We can redefine how people live together through improved energy use, environment, infrastructure, neighborhoods, education, healthcare, safety and security.

3. America will reestablish itself as the leader in new technologies worldwide for the next several decades.

Together, we will establish a new level of pride and achievement for our country! I am pleased with your presence and look forward to your continued involvement.

Sincerely,

Don Young, Chairman
Committee on Transportation & Infrastructure
US House of Representatives
Transforming America’s Infrastructure
With Science and Technology

September 27, 2005

Agenda

1. Chairman Don Young’s Opening Remarks
2. Introductions
3. Video Presentation
4. General Meeting Discussion
5. Chairman Young’s Closing Remarks
6. Adjourn to Science Committee for Modeling and Simulation Caucus Briefing

Meeting Goals

1. How do we build and rebuild in the most efficient and effective way.
2. Can the experience that you have had in other industries be applied to the construction, transportation, infrastructure industries?
3. Seek commitment to participate collaboratively with the other companies and the government.
August 25, 2005

Dear

As you are aware, our country's transportation infrastructure is at a crossroads. The United States Department of Commerce reported the construction industry's productivity slipped by 135% when compared to other industry sectors over the past few decades, eliminating more than $1 trillion in economic benefits to the country annually. At the same time, costs rise and the demand for new dollars for infrastructure projects continues to outstrip resources.

I believe our great nation has the opportunity to aggressively integrate information and communication technology into the American construction industry, and particularly into transportation projects. In turn, this will stimulate new markets, enhance America's competitiveness, and erase this productivity gap in the construction industry. As Chairman of the House Committee on Transportation and Infrastructure, I am asking for your help, because of your proven leadership, vision and demonstrated commitment to America.

The construction industry is very fragmented and geographically distributed and in major need for collaborative environments that can support project delivery coordination from design and build to operations. I am convinced that your insight is critical for us to develop ways to provide technologies that will enable profound changes in the industry and offer a large space for business growth.

After four years of hard work by the Congress, the President recently signed the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU) into law. SAFETEA-LU includes a provision that establishes an initiative to demonstrate how digital technologies can be used to achieve savings and efficiency in the planning, design, and construction of large scale transportation projects.

The sponsors of several such projects funded by the new law have expressed an interest in using these technologies in all phases of their projects. With your help, I am confident we can use SAFETEA-LU as a catalyst to prompt greater use of digital technologies in this industry, thus creating a market for those technologies in this immense sector of the global economy.
I respectfully request that you:

☑ Watch the enclosed DVD, prepared by private sector construction experts, highlighting the challenges facing the construction industry and providing an overview of a proposed solution.

☑ Personally commit to participate with eight other leading corporation executives and three executives for large projects funded in SAFETEA-LU in a working session on September 27, 2006 beginning at 2:00 p.m. to develop a roadmap for applying technology to the construction industry and other government owned projects. The meeting will take place in my office at 2111 Rayburn House Office Building, Independence Avenue and South Capitol Street SW, in Washington DC.

Contact information for the invited company and project executives is attached. The Secretary of Transportation, Norm Mineta, has also been invited.

My Chief of Staff, Michael Anderson, will contact your executive assistant after Labor Day to personally answer any questions you may have. Our staffs can then coordinate the logistics of the meeting at that time.

I have invited some of the great minds in our country to create a platform for applying cutting edge technologies to revolutionize the world’s approach to construction starting with our transportation infrastructure. I am confident we can collectively achieve innovation through technology to open new business markets globally, create jobs, reduce energy usage, and enhance security. I look forward to seeing you at the meeting.

Sincerely,

Don Young, Chairman
Committee on Transportation & Infrastructure
United States House of Representatives
Dear

Two weeks ago I contacted you to enlist your involvement in helping America harness its technology leadership to revolutionize the construction industry, particularly as it relates to our nation's transportation needs. I identified three major, nationally significant projects that can demonstrate the tremendous benefits and cost savings of applying the latest technology to building our nation's infrastructure. I am convinced these savings and efficiencies can be realized, especially if you are willing to participate directly in this effort.

If we show the nation how to leverage important federal resources via these demonstration projects, imagine what we might do to help rebuild our Gulf Coast region. The destruction of Hurricane Katrina compels us to find ways to efficiently facilitate rebuilding roads, bridges, workplaces, and much, much more. I know your corporation has already demonstrated compassion and thoughtfulness in response to this catastrophe -- for this I thank you. This tragedy presents a call for us to serve our country in a time of great need. It also offers an opportunity to develop policy and practice that will redefine the fundamental methodology of infrastructure design, construction and security.

This is a call to action. Our collaboration will create an accelerated platform not only to rebuild and improve our nation's infrastructure, including on our southern coast, but to answer looming questions: In the process of rebuilding can we give the affected communities all that America's technology is capable of? Can we do it right?

With this in mind, I would like to ask you to redouble your efforts to hold this date on your schedule to allow for your personal participation. Together we can make needed national transportation improvements and help restore lives and livelihoods to hundreds of thousands of Americans.

Sincerely,

Don Young, Chairman
Committee on Transportation and Infrastructure
U.S. House of Representatives
Reason for Company Invitation and Participation

Boeing

The Boeing Company represents one of the premier technology and systems development organizations in the world.

Boeing has led the integration of 3D design, building and operation, with the success of the world’s first fully digitally developed aircraft, the model 777. Boeing established the standard for using 3 dimensional design and manufacturing processes.

Boeing is also a leader in system engineering, supplying complex space and military systems requires the management and control of many technologies to solve very difficult problems.

Boeing also has led the nation in establishing economic collaboration with its development partners.

Cisco

Cisco is the world’s largest networking company. Cisco specializes in providing technology for wired and wireless networks along with a major push in telephony solutions.

Its networks are an essential part of business, education, government and home communications. Cisco Internet Protocol-based (IP) networking solutions are the foundation of these networks, and the mission of the company has remained consistent—fundamentally changing the way we work, live, play and learn.
Dassault Systemes

Dassault Systemes brings over twenty years of great experience in leadership of the 3D revolution in aerospace, automotive and shipbuilding industries.

DS was the first to deliver 3D for the whole product lifecycle management (PLM) process. This enabled profound improvements in the way organizations collaborate in the creation of better products and motivate innovation.

Their manufacturing integration is a key success factor in transforming the construction industry and DS is already provides the means to address this need.

EMC

EMC Corporation is the world leader in systems, software, services, and solutions for information storage and management. They help organizations of all sizes across the globe implement Information Lifecycle Management (ILM) strategies that enable them to better and more cost-effectively manage, use, protect, and share their information.

EMC products and services are helping customers through asset utilization, automation of information, storage infrastructure and regulatory compliance.

IBM

IBM is recognized as one of the world leaders in information technologies, including computer systems, software, networking and storage devices, all of which are extremely important in the advancement of the construction industry.

IBM has significant experience in working with Dassault Systemes and others developing the types of technology solutions that are needed to address complex issues.

IBM has a successful history of partnering with government.
**Microsoft**

Microsoft is the world’s largest software manufacturer building integrated platform solutions. The company’s products now serve to empower individuals, companies and governments with efficiency and productivity tools. Microsoft is also working to help people realize their full potential.

Microsoft’s products have achieved enormous penetration in the homes, businesses and schools of the world. There are nearly 600 million installations of Microsoft Windows products globally.

**UPS**

Demonstrating environmental and corporate responsibility by using modeling technology to reduce mileage of package cars by more In depth understanding of managing global resources, logistics and specialize transportation. UPS has become an expert in global distribution, which is defined as managing not only the movement of goods, but also the flow of information and finances. This practical knowledge and expertise is needed in both the advancement of the construction industry as well as the rebuild of New Orleans.

**3M**

3M (Minnesota Mining and Manufacturing Company) is one of the world’s largest highly diversified innovative companies.

Innovative Markets – 3M is constantly striving to launch new divisions that address its customer’s needs. The ‘3M Construction Markets’ initiative was recently launched to focus on Power & Utilities, Oil & Gas and Infrastructure projects. These new technologies will be developed and applied to deliver fast and easy solutions for the various complexities in industrial construction.
The Knik Arm Crossing Project is being developed to meet the current and projected transportation needs of the Municipality of Anchorage and the Mat-Su Borough. Considerable infrastructure improvements, as well as an expanding regional population base, have created greater needs for access to developable lands, efficient freight and goods movements within the region and to areas further north, and an improved, reliable, and safe regional transportation system.

The goal is to construct a cost-affordable, vehicular toll bridge of about 2 miles across Knik Arm to join the Port of Anchorage area and Port MacKenzie area. The purpose of this project is to build a bridge to fulfill the following needs:

- An efficient link between the operations and infrastructure of the two ports;
- An alternate north-south emergency response and disaster evacuation route;
- Transportation infrastructure for existing and projected population and economic growth;

Location: The project area is in Upper Cook Inlet in the Knik Arm north of the Port of Anchorage and south of the confluence of the Knik River and the Knik Arm. The Knik Arm separates the Municipality of Anchorage from the Mat-Su Borough by about two miles in this area.
ALASKA STATUTE 19.75

KABATA was created by the Alaska Legislature in 2003 to develop, stimulate, and advance the economic welfare of the state and further the development of public transportation systems in the vicinity of the Upper Cook Inlet with construction of a bridge to span Knik Arm and connect the Municipality of Anchorage and the Matanuska-Susitna Borough.
Elmendorf AFB

Port of Anchorage

Knik Arm

Port MacKenzie
Area of coterminus U.S. is about 3,119,885 square miles.

Area of Alaska is 663,267 square miles.

Area of West Virginia is 24,230 square miles.

Area of Mat-Su Borough is 24,694 square miles.
Population Growth

HISTORIC GROWTH 1980-2003

Historic Population of Region 1980-2003

PROJECTED POPULATION 2004-2050

ISER Population Forecast

2030 ISER Population & Employment

- 550,000 People (~200,000 households)
- +72% regional growth over year 2000

With Bridge:
- 5,800 households shift
  - -4.5% Anchorage
  - +8.7% Mat-Su
- 6,700 jobs shift
  - -3.7% Anchorage
  - +13.4% Mat-Su
## 2030 Population Estimate – Northern Economics with ISER

<table>
<thead>
<tr>
<th></th>
<th>Without Connector</th>
<th>With Connector</th>
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<tbody>
<tr>
<td>Anchorage</td>
<td>361,670</td>
<td>345,445</td>
</tr>
<tr>
<td>Mat-Su</td>
<td>187,530</td>
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</tr>
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</table>
Engineering Studies

- Corridors and Alignments
- Bridge Design Issues
- Seismic and Geotechnical
- Hydraulic/Hydrologic and Sedimentation
- Currents, Tides, and Ice Flow
- Refining Cost Estimates
- Construction Planning and Phasing
- Construction Logistics and Material Sources
• Includes:
  – Bridge Structure
  – West and East Bridge Approaches
  – Inflation through 2010
  – Contingency
  – Allowance for Cost Overruns
• Does Not Include:
  – Operation and Maintenance Costs

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Northern Corridor—Two Lane, Posted 55 M.P.H.

Rebuild 5 miles and upgrade 4.6 miles, two lane

3.66 Miles Upgraded

4.60 Miles New

Interchange, Toll, and Frontage Roads
Crossing - Three Lane, 7,000-12,500 Span
Concrete Bridge Concept

Steel Bridge Concept
Anchorage Approach –

Below the Bluff Corridor

- Two mile, 4-lane road, tidal fill
- 4-lane road, retained fill, 1.31 miles on bluff behind port
- Cut and Cover Tunnel, 0.71 mile road & Connection to A/C
- 0.48 miles, 4-lane with trail, Security fencing, and interchange
- 4-Lane Viaduct, Tank Removal, 0.97 Mile Road, Trail, and Security
- Degan Bored Tunnel, Bridge over East Loop, 4-Lane Viaduct, and Highway to Highway Interchange
Above the Bluff Corridor

- Degan Bored Tunnel
- Bridge over East Loop
- 4-Lane Viaduct
- Highway to Highway Interchange

- 0.3 miles, 4-lane, Security fencing, and A/C interchange
- Cut and Cover Tunnel, Connection to A/C
- 4-Lane Viaduct, Tank Removal, 0.97 Mile Road, Trail, and Security

Anchorage Approach –
Destiny USA is a fully integrated complex designed to maximizing the consumer experience across retail, entertainment, recreation and hospitality.

Destiny USA is an 800-acre waterfront resort featuring the world’s largest enclosed and integrated structure and will be constructed and operated fossil fuel free. Located in the heart of New York State and easily accessible to 130 million residents throughout the northeast United States and Canada, this master-planned development will be the most visited single leisure destination on earth. Destiny USA’s dining, shopping, entertainment, hospitality and recreation venues will be physically and virtually connected, providing guests with a matchless combination of experiences and convenience.

The design and construction of Destiny USA will be as innovative as the visitor experience. Proven design technologies used in aerospace and other industries will transform the Destiny USA construction process. Employees and companies alike will be motivated to maximize efficiency and innovation by a construction competition of unprecedented scale, similar to the competitive model driving our onsite innovation in alternative energy sources.
A Letter from Our Chairman

The Destiny Company was born from the heartfelt desire to give something back to the country that has made so many dreams come true for me and my family. America is a place where opportunities are limited only by our imagination, strength of spirit and willingness to work tirelessly to achieve our goals.

Today we have an extraordinary opportunity to rekindle the American ingenuity that defined this nation to build a better future by:

• Minimizing our crippling dependence on fossil fuels.
• Reigniting technological innovation.
• Revitalizing communities in decline all across our country.
• Reestablishing global leadership and restoring America’s international image.

The Destiny Company was created to achieve these goals through the creation of a living laboratory; the integration of research and development, collaborating companies and the Destiny USA development in Syracuse, New York. Upon completion Destiny USA will have a value of $25 billion and will define a new experience in entertainment, retail, dining and hospitality for millions of visitors from around the world. Destiny USA will also be an interactive showcase of the world’s leading companies and ideas.

I am incredibly proud of a positive economic impact including hundreds of thousands of new jobs that Destiny USA will stimulate. All of this is being done while proving that government and the private sector can partner in a manner that shields the taxpayer from any cost or risk.

Our vision is to create awareness to help each individual realize a better tomorrow. Awareness embodies competition, innovation, collaboration and the desire to search for new answers.

We will make this vision a reality by:

• Leading by example through our actions and those of our partners
• Positively impacting people's lives – our visitors, employees and partners.
• Reenergizing the American dream – its independence, safety and prosperity.
As 95% owners of this initiative, my wife and I are committed to Destiny USA’s success and the opportunities it represents for America. It is in that spirit we will dedicate 100% of our profit from Destiny USA annually, for our lifetime. This profit will be directed into the research and development necessary to both end this country’s dependence on foreign oil and assist the creation of new technologies to help improve our lives.

Sincerely,
Robert J. Congel

Chairman
The Journey Towards Our Destiny...

Chapter I

It began back in late 1999, when Onondaga County Executive Nick Pirro approached us about expanding Carousel Center. The idea was to create a shopping center that would be bigger than the Mall of America.

*The Traditional Approach*

It began as a traditional process and because of our past experience with Carousel Center, we knew that it would be extremely costly to build the foundation and infrastructure for the project due to poor soil conditions. We decided that with the appropriate incentives in place, we would be willing to go ahead with the project. That led to the approval of a 30-year Payment in Lieu of Tax (PILOT) agreement, which would in effect trade the community’s right to future property taxes for the significant sales tax revenues that would be created from an expanded Carousel Center. This PILOT agreement approved in 2002 protected the taxpayers from risk and ensured as an outcome that they would receive more in sales taxes than they would be giving up in property tax revenues – in effect creating no cost. It was an unprecedented action on the part of the community and represented for us an opportunity that we would only begin to truly understand.

In early 2001, a team of people was assembled that came from outside the real estate or construction industry to think about how the Carousel Center expansion could be executed. Our initial thinking was that this could be a great regional tourism draw and we worked with national firms to study where people would come from. We saw an opportunity to promote Upstate New York and successfully asked the State to dedicate their share of sales taxes generated from the expansion into a fund which could be used to market the region to people from outside New York State.

Chapter II

*The Opportunity & Struggles of a New Approach*

Through most of the early part of 2001, our thinking was very traditional – we were developing a large building. We made the decision to build the expansion in one phase. During this time, we continued to discuss and debate the merits of the PILOT Agreement, often times in disagreement over how it could be applied to create maximum opportunity. It was hard for us to think about the future in a way that was different from what our past experiences had taught us. Yet we all knew that for us to truly create something great, we would need to get out of our own way.
An example of this was how we approached the challenging weather conditions of the region. Rather than seeing it as an obstacle, it became an opportunity. It led us to the idea of creating a large enclosed park on the roof of the expansion. It would be a place our visitors could enjoy year round, offsetting the inconsistent weather pattern that is prevalent in the Northeast.

We were all excited about building this great tourism destination because we knew it would create a lot of jobs and tax revenues, and be a fun place for people to visit. This was especially important to us given the consistent trend of a declining economic infrastructure that had been plaguing the Upstate New York region for the past few decades.

Chapter III

The Need to Give Back

The events of 9/11 shocked our group just as it shocked the world. It brought into focus our country, the challenges and vulnerabilities we faced, issues regarding security and the issue of energy. It brought back memories of Bob Congel’s trip with his family to Normandy, where it was clear that the sacrifices paid by the young soldiers who died securing our freedom should never be in vain. We spent a lot of time discussing the importance of “giving back” to our country, be part of something we could take pride in as Americans and help our country in a meaningful way. It became clear to us that our project could represent something well beyond a building, but be about ideas. This is when the Carousel Center Expansion transformed into Destiny USA. We began the exchange of ideas between ourselves and many others to work towards a common goal – an initiative resulting in pride and continued benefits for many years to come.

Chapter IV

Realizing the Possibilities

Beginning in 2002, we started talking to large companies in the fields of security, technology and energy about how we could operate Destiny USA and the chance to bring new technology-related industries and jobs into our community. We hosted an international symposium on renewable energy and sustainable building design in April of 2002. We invited leading experts from around the world in the fields of renewable energy, sustainable design and environmental excellence to come together to talk about the challenges and opportunities that were currently being discussed in the industries. One of the clear and disturbing points that came out of this conference was the country’s addiction to foreign oil and the negative implications that it represented. This addiction threatens our security, our economy and our country’s status as a world-leader. It was then that we publicly proclaimed our goal to construct and oper-
ate Destiny USA 100% fossil fuel free. We knew as Americans it was too important for us to avoid doing everything we could to contribute to this positive outcome. There was shock and disbelief, even among the energy experts we gathered. Many wondered out loud whether it was even possible. In spite of this reaction, the commitment remained unchanged. After this event, it became clear that Destiny USA represented an opportunity to showcase ideas and solutions to the challenges we faced in the energy and security areas to millions of people from around the world. It was our first realization that Destiny USA was really about creating awareness and driving awareness.

Chapter V

Putting the Model in Place

We were then faced with two large challenges – how to generate enough capital to support this huge idea and how to make sure that millions of people would truly want to come to visit. We knew that the PILOT agreement and the Empire Zone program would be very important parts of our solution and we began to look at other opportunities to create or combine economic development programs which could work together to drive this initiative. In early 2002, we worked with City, County and Federal representatives successfully to have our community designated as a Federal Empowerment Zone. Later in 2002, we initiated a strategy with other renewable energy projects around the country to get the Federal government to participate with our renewable energy commitment through a program which became known as Green Bonds. Green Bonds were passed into law in 2004 as a mechanism to commercialize renewable energy technologies. The Onondaga County Legislature agreed to dedicate their share of hotel occupancy tax revenues into marketing our community and we explored additional opportunities for the NYS Empire Zone program to find ways that it could work towards helping us achieve our goals. Later in the process, we incorporated New York State’s Brownfield Redevelopment incentives into our model because Destiny USA was being created on a large environmentally-distressed site.

The outcome of all this effort resulted in a brilliant financial model that would serve as the engine to drive Destiny USA. The beauty of the model was found in its simple essence. On one hand, it provided substantial incentives, which gave us the ability to create any size project possible as long as we could justify paying what amounted to an average of 60% of the property taxes associated with that project. And on the other hand, it generated significant benefits in the form of new jobs and tax revenues to the public sector, insuring that there would never be anything other than net positive revenues in return for these incentives. The other intriguing element of this model was that at each step of the way, the public sector and taxpayers were always ahead when you looked at the
revenues they received as opposed to the incentives we earned, because the programs were structured requiring that benefits were only earned after we performed.

Chapter VI

Believing the Possibilities

Even after we created this model, we struggled. Many times internally, we questioned whether this model was as good as it appeared in concept. We debated, resisted and even argued about the reality that was staring us in the face. It took us a long time before we came to grips with the maximum potential that it offered. An example of this was our internal discussion regarding how many hotel rooms we would need to build. We knew instinctively that tens of thousands of hotel rooms would be needed to accommodate the millions of out-of-town visitors that were projected to come, yet we resisted committing to build these rooms using our model. Only after significant discussions did we see the true opportunity in this area.

Once we began to accept the true potential that we had, it became clear that the fuel for both the financial model and our ability to attract the best companies to drive new research, we needed to create something that would bring millions of people to visit every year. So we continued to refine our ideas for creating the greatest visitor destination found anywhere; a place where a new level of service and experience could be created because of our opportunity to apply our financial model in a way that all of the physical and virtual elements of Destiny USA could be connected. It became clear to us in the process that in addition to awareness, Destiny USA would really become the largest and most exciting research complex every imagined. A place where for the first time, active research could occur with the interactions and involvement of millions of people in a real life setting designed to create outcomes to improve the way people live their lives.

Chapter VII

Untapped Opportunities

As we continued to focus on the huge potential for bringing companies and people together in new ways, the quality of the resulting research and intellectual property became enormous, in fact, in some ways unlimited. We began to stretch ourselves to think about the possibilities. With each new company came new ideas. With each new idea came new opportunities and with each new opportunity came the chance to reinforce our commitment to do something that could positively impact our country and the world.
We soon went well beyond our commitment to operate 100% fossil fuel free. We were confident that we could impact the country’s dependency on imported oil by creating a competitive environment focused on building widespread awareness of new renewable energy solutions. People’s awareness of renewable energy would lead to acceptance and their use would increase dramatically.

Our research and development focus continued to expand well beyond renewable energy, technology and security into many other areas that could positively impact people’s lives. Concepts and technologies such as RFID, indoor air quality, waste management programs, human behavior satisfaction and workforce performance could also be studied and improved. The most innovative idea continues to live on, promoting new research and development in an environment that is unprecedented. The impacts and benefits that can grow from research expand well beyond the physical boundaries of any building structure. We will succeed in taking R&D out of the back room and putting it on center stage for the world to benefit.

Chapter VIII

Falling into Place

**Opportunities were realized** in the years 2004 & 2005. Over a dozen trips to Europe resulted in commitments for international retail and dining content new to the United States, as well as exciting design progression. “Green Bonds” were approved by the United States Senate and House of Representatives – an unprecedented step forward for projects committed to the use of renewable energy and sustainable design.

In December 2004, we closed on a loan for nearly $700 million to be used for the transformation of Carousel Center into Destiny USA. Following this critical piece of financing, there was an intense focus on bringing together the right people and companies to develop the technology and resources necessary to bring Destiny USA to life. Hundreds of people were brought together to “mine their minds” in the areas of Design & Construction, Security, Energy, Workforce and Logistics. These were intensive brainstorming sessions where the most out-of-the-box ideas were transformed into detailed plans for implementation.

We realized that in order to implement these technologies and tools successfully, we needed these companies to imbed themselves into the culture of our team and work collaboratively together. By July 2005, over 150 people, representing dozens of companies were collaborating at the former Carousel Center Skydeck, now the Destiny USA Center for Collaboration & Innovation. We invested over $3 million to build the Center, along with over $2 million of state-of-the-art equipment to create the technology infrastructure necessary to support our plans to cre-
ate Destiny USA. Major initiatives are currently underway in the areas of digital simulation and modeling technology used to design & construct Destiny USA and workforce recruitment, training and development.

One of the most pivotal milestones for our project occurred on August 23, 2005, we first 200 Destiny USA team members were offered positions beginning on October 3rd. Our innovative workforce model that focuses on personal characteristics rather than a person’s “resume” enables us to open the doors of opportunity to a diverse, motivated and creative pool of individuals.

Shortly following the workforce announcement, literally “tons” of steel arrived in Syracuse by train from Indiana. The delivery of over 8,000 pounds was only the first order of the over 27,000 tons of steel necessary for the building foundations for the first phase of Destiny USA.

The collaboration center, steel delivery and hiring of the first people who will build and operate Destiny USA represent the manifestation of how prepared and committed we are to seeing Destiny USA realized.

Chapter IX

*The Journey Continues*  
**While the journey to date** has included many paths, and many challenges, the one constant that has remained unchanged throughout is our team culture. It provides us with the mental strength and focus that is necessary to continue to move an initiative of this magnitude forward. While much has been accomplished, there are still more great things to come. We are excited, passionate and committed to our goals and we are confident that with the energies and ideas of those involved, we will succeed.

*To Be Continued…*
The Alaskan Way Viaduct & Seawall Replacement Project

The Alaskan Way Viaduct & Seawall Replacement Project is a highway that will connect Seattle's economic future. The project will address the urgent need to replace both a 52-year old viaduct and 71-year old seawall by creating a two-for-one solution: the tunnel replaces the viaduct and along the central waterfront, the tunnel's west wall replaces the seawall.

Currently, one quarter of all north-south traffic through Seattle (103,000 vehicles) use the viaduct every day. The 2001 Nisqually earthquake significantly damaged a portion of State Route 99 through downtown Seattle and has caused extreme congestion on I-5 and in the downtown city grid. This is a critical route that needs replacing. WSDOT estimates that if the viaduct is no longer usable, travel time through the downtown Seattle area will double. As people look for alternative routes to get around, I-5, I-405 and local streets will become even more congested.

The Alaskan Way Viaduct & Seawall Replacement Project will create safe, seismically sound replacement structures for the viaduct and seawall. It will maintain traveler capacity and keep Seattle traffic flowing. The new tunnel will create a new waterfront for all to enjoy. It will be more pedestrian- and bicycle-friendly, and will improve access to destinations such as Colman Dock, Seattle Aquarium, Pike Place Market and the sports stadiums.

The Alaska Viaduct is the #1 transportation priority in the state of Washington. The Viaduct carries about 110,000 vehicles each day - about a quarter of all north-south Seattle traffic.
The Alaskan Way Viaduct and Seawall Replacement Project
Uncovering the potential for Seattle’s waterfront and State Route 99
THE ALASKAN WAY TUNNEL

Building a tunnel is the right choice because it:

- Preserves capacity for a corridor that is vital to our transportation network and for the region’s economy
- Provides an essential alternative to I-5 for people and goods moving through Seattle
- Creates a two-for-one solution: the tunnel’s west wall serves as replacement for the crumbling seawall
- Provides connections for West Seattle, Ballard/Interbay and Magnolia and other neighborhoods
- Seizes an opportunity to remove a noisy barrier and re-connect Seattle to its waterfront
- Vastly improves the waterfront as a regional destination
- Improves the vitality of Seattle’s downtown and nearby neighborhoods, encouraging close-in living
- Provides a unique opportunity for bicycle lanes and pedestrian promenades
- Improves the water quality of Elliott Bay

The Tunnel Secures the Future for Seattle and the Region

There is an urgent need to replace the Alaskan Way Viaduct (State Route 99) and the Seattle waterfront Seawall. It is a 100-year decision for Seattle and the region.

The longer we wait, the more we risk: The Viaduct is aging and brittle. It has moved three times since 2001, the year of the Nisqually Earthquake. Experts say the Viaduct has a 1 in 20 chance of failure from a major earthquake over the next 10 years.

In addition to serving the needs of commuters, the tunnel is vital to freight users and the port. It will ensure that the city’s north and south industrial areas are linked and keep 1.5 million freight trips moving through the region.

The tunnel is also the best chance to get the funding we need for the project we want.

The urgency to replace the Viaduct is real, and that is why the partner agencies are also advancing the Rebuild Alternative through the EIS phase of the project. It will serve as an “insurance policy” that provides a back-up alternative, if needed, to replace this vital transportation link.
The tunnel will be built to the highest industry design, safety and seismic standards.

- Federal regulations require emergency exits for stranded motorists every 1,000 feet, ensuring that drivers and passengers will be able to quickly exit the tunnel in the event of an emergency.
- Electronic Message Signs will be installed throughout the tunnel to keep travelers informed of traffic and safety situations ahead.
- Fire extinguishers and emergency telephones will also be provided throughout the tunnel.

The Project Corridor

- South of downtown at Spokane Street, SR 99 will begin as a surface highway. The project will also construct a new aerial interchange at Atlantic and Royal Brougham Way.
- Just south of King Street, the highway will dip into a six-lane tunnel (depicted) that will run beneath the central waterfront.
- Near Pine Street, the tunnel will emerge, taking drivers over a new structure that will continue to the Battery Street Tunnel. The Elliott and Western ramps will remain in place, maintaining key access points for travelers.
The Alaskan Way Viaduct and State Route 99 make up a vital branch of our transportation system. The SR 99 corridor, with the aging Alaskan Way Viaduct as its centerpiece, is a crucial link in our region’s transportation system. The highway serves as a major commuter and freight route and is the only north-south highway link through downtown Seattle other than I-5.

If we don’t replace the Viaduct, the forces of time or nature will do it for us. Without this critical link, severe traffic will fill downtown streets, surrounding neighborhoods and I-5.

Even with major investments in transit, roadways and local arterials, we still need the capacity the corridor provides, or the region will face increased congestion. The cost of this congestion is conservatively estimated at over 10 million people-hours of delay and a yearly cost of $190 million to the regional economy. Over time, these congestion costs will only rise.

We’ve learned this much: It will cost more to lose the Viaduct than it will to replace it.

We have a plan to replace it. The new facility will last for generations. The Viaduct project could, over its first 24 years, pay for itself in avoided costs of congestion and delay alone.

Project Cost
The Tunnel Alternative: $3.4-$4.1 billion

Project Schedule*
2006 – Issue final Environmental Impact Statement
2007 – Obtain environmental approvals
2008 – First-phase design complete
2009 – Begin construction
2016 – Project complete
*Pending funding

Contact us!
• Visit us online at www.wsdot.wa.gov/projects/viaduct
• E-mail us at viaduct@wsdot.wa.gov
• Call the project hotline at (206) 269-4421

City of Seattle
U.S. Department of Transportation
Federal Highway Administration
Washington State Department of Transportation
SEC. 10210. DEMONSTRATION OF DIGITAL PROJECT SIMULATION.

(a) In General-

(1) DIGITAL PROJECT SIMULATION DEMONSTRATION PROJECT- The Secretary shall establish a demonstration initiative using digital project simulation to plan, design, and construct the project listed in item 459 designated in section 1934 of the SAFETEA-LU.

(2) COOPERATION- To be eligible to receive funds made available for the project referred to in paragraph (1), the project sponsor, including private entities working with the project sponsor on the project, and the State shall enter into an agreement to work cooperatively with the Secretary to use digital project simulation for such project and to evaluate the effectiveness of using such simulation.

(b) Simulation Program Development-

(1) IN GENERAL- In establishing the demonstration initiative under subsection (a), the Secretary shall provide, to the extent practicable, that--

(A) the planning, design, and construction of the project is carried out by using digital project simulation to achieve savings and efficiency in investment planning, project delivery coordination, and facility management; and

(B) in constructing such project, the project sponsor use digital lifecycle management techniques, including the use of embedded electronics and software to monitor performance of the infrastructure and provide safety and security information to the project sponsor.

(2) COLLABORATION- The Secretary, the State, and the project sponsor may consult with technology companies and educational institutions that strive to develop and enhance technologies, including digital project simulation, that save money and time by using efficient methods of design, construction, and operation for transportation infrastructure projects.
(c) Report-

(1) IN GENERAL- Not later than one year after completion of the project described in subsection (a), the Secretary shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate a detailed report comparing the application of digital project simulation for such project to more traditional approaches to planning, design, and construction.

(2) PERFORMANCE MEASURES AND RECOMMENDATIONS- The report shall also include--

(A) a description of the performance measures applied, including cost comparisons and length of construction; and

(B) recommendations, if any, for administrative or legislative action.

(d) Definition- For purposes of this section, the term `digital project simulation' means computer-assisted three-dimensional technology and digital lifecycle management.

Project #459 is NY Various transportation projects related to the DestiNY USA project
New Orleans in Five Years
An example of what is possible

Like many U.S. cities from east to west, their better days are behind them. Except for their internal economies, and some pass through commerce, their future is somewhat fragile in a global economy. They are victims of infrastructure designed for a previous age. And for many of their citizens, the aging houses serve mostly as a refuge for those who couldn’t, or wouldn’t make the transition to a better opportunity.

Their institutions mirror their reality. Old schools, unplugged from modern networks have no choice but to reflect their surroundings. Despair is bred in these environments, and so is crime. Even the glitzy facades of the tourist districts can’t totally hide what exists only a few blocks away.

Name many older cities, and this description will be remarkably accurate.

And so it was with New Orleans, until a brush with disaster in 2005 energized the great minds of America, and they responded in ways that could only have come from the home of the brave.

They didn’t blueprint a new city, they 3-D modeled it. They didn’t rebuild a city, they created a new one.

The lakes and the levees which once warily protected the old city have become the source of pride of the new city. They are stronger, more efficient, and they talk to us 24 hours a day. They are a real-time participant in the city’s future. New Orleans is now pioneering self-protecting infrastructure.
The schools serving the families of New Orleans, are now among the most modern and effective in the country. Yes, they were 3-D modeled, and they were built, or rebuilt, with technologies that provide connectivity, distance learning, energy efficiency, interactive curriculums, Wi-Max, district wide evaluations, parental inclusion, and enormous enthusiasm. Attendance and graduation rates are among the highest in the nation.

The port of New Orleans is the most secure port in the world. Its traffic is monitored in all dimensions, its water is tested 24 hours a day. There are threat sensor technologies imbedded throughout the great waterway and the issue response protocols have been modeled and tested. They are the best. It is now a prototype for every other port.

The roads and bridges around New Orleans carry more than cars and trucks. They are sensor networks which monitor traffic, weather, and even their own condition. They can tell you when and where they need maintenance. People drive hydrogen cars and New Orleans is leading the way to a hydrogen economy. A state of the art Nuclear Reactor powers the hydrogen process.

If healthcare was ever an issue in New Orleans, it is not anymore. When the medical infrastructure was rebuilt, the modeling took into account that with the new telecommunication infrastructure, much of the people’s needs could be delivered right to their homes or workplaces. Physician’s offices and medical records are mostly virtual, and electronic systems have eliminated paper. Doctors consult from around the world, patients are remotely monitored around the clock, and the new efficiencies have kept this critical system affordable, providing access to all.
The environment is clearer because New Orleans now gets 60% of its energy needs from renewable sources. Yes, the waves and the wind help to power the city, side-by-side with crops that make bio-diesel. Most New Orleans residents are aware that reducing global warming may indeed lessen the hurricanes which devastated the city only five years ago.

As can be imagined, recycling is universally practiced here.

Just as jobs have always flowed to innovative communities, New Orleans is one of the nation’s hot-spots. The region is now an R & D hub as these new technologies find application nationwide and worldwide. Worker training is available online, at home, in schools, at work and is now part of the workplace culture.

Universities are thriving with new majors and a global student body. It seems what happened here has real cachet.

People feel safe here, and they should. The streets and playgrounds are always monitored and the citizens have 24/7 access to the information they provide. Parents can check on their school children from work or home, and fiber and wireless broadband have network-wide safeguards.

People now have more say in their governments as online polling brings the issues directly to the citizens.

Tourists are back in large numbers and not just for the music, the festivals and the history. The arts are enjoying a renaissance and cultural activities are available to the masses. But more than ever, people come here to see the future.

And you know what? It doesn’t look all that different than it used to. You really can’t see, or touch, much of what is new.

The Dixieland Bands still make great sounds down on Bourbon Street, but now the kids in high school music class can watch it live.

They aren’t the only ones watching New Orleans. The whole world is tuned-in.
Congress led the way in partnership with America’s technology companies. Indeed, this pioneering collaborative has become a model for how government and the private sector now work together.

The new in New Orleans now has much more significant meaning.

**What the technology led rebuild will mean to the citizens of New Orleans**

**Economic Benefits:**
- Economic Opportunity will explode as a product of creating a renaissance throughout the city
- New residents will arrive pursuing new careers
- Research and development opportunities will be created through the rebuild
- A whole new level of entrepreneurship evolve and drive new businesses
- An influx of private capital will underwrite business creation

**Cultural Enhancements:**
- The fundamental culture will transition to one of success
- Newly discovered pride will become contagious
- New investments will drive social will enhancements throughout the region

**Healthcare:**
- Technology will digitize the health care system creating the national model
- The digitization of medical records will streamline access and treatment
- Fiber and wireless networks allow citizens unparalleled access to health care systems and lifestyle information
- The efficiencies will lower the cost of healthcare and expand accessibility
- Research initiatives will spring from the new system and will drive university expansion and involvement

**Education:**
- Connectivity facilitates New Orleans having the world as a classroom and as a teacher
- Safety is enhanced as new systems provide security protocols using the latest technologies
- Students have access to systems and software at the highest levels
- Customized curriculums are available to every student
- A new level of pride in schools raise expectations and results
Neighborhoods:
- Safety systems are everywhere, from monitors to connectivity
- Citizens have access to all the monitoring systems
- Neighborhoods feel secure and proud
- New hope facilitates pride and caring within neighborhoods

Mobility:
- Rebuilt roads and highways allow access to jobs and recreation
- New safety and efficiency reduce commute times
- New energy options allow for cleaner environments

Infrastructure:
- New roads, bridges and transit systems are the most efficient in the world
- Intelligent roads facilitate traffic flow, maintenance and conditions
- Connectivity allows traffic and weather conditions to be available everywhere

Government:
- Constant online polling allows continuous feedback to all levels of government
- Electronic identification allows secure relationships with all government agencies
- Online systems facilitate everything from tax payments to licences

Energy and Environment:
- New energy infrastructure allows extensive energy options
- A “Green New Orleans” is a model for the world
- Energy R&D is now a major economic engine

The sum total of all of this is a city bursting with pride, bustling with opportunity, and welcoming the future with open arms. The excitement of tomorrow is evident everywhere. From the school children to the long-time residents, people look forward to every new day.
White Paper prepared for CERF / CAB Executive Conference, Spring 2005
April 12-13, 2005 - Sheraton Premiere, Tyson’s Corner, Virginia

Avanti C. Shroff / Michael Goode / Neculai C. Tutos

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**Arup USA –Group**, David Palmer, Principal, Infrastructure Division
**Bechtel Corporation**, T. E. Richardson, Senior Vice President & Manager of Engineering, Chairman of the CERF Board
**CH2M Hill Companies, Ltd.**, Joseph A. Ahearn, Vice Chair, CH2M Hill Companies, Ltd. and President, Transportation Business Group: CAB Chairman
**CERF**, Michael Goode, Vice President & Director of Industry Programs
**Dassault Systemes**, Neculai C. Tutos, VP Corporate Business Development
**Edwards and Kelcey**, Avanti C. Shroff, Vice President
**Gatsby Hannah LLP**, Richard Allen, Partner
**Northrop Grumman**, Raymond A. Heider, Technical Director, Homeland Security
1. Introduction

The many decades old crisis facing the Construction Industry has reached an alarming level characterized by high project cost and risk for investors with low and decreasing profit margins for engineering and construction organizations and suppliers of facility equipment, systems and components.

Construction projects are high risk investments and in the absence of a better solution the industry has evolved contractual and project delivery practices based on complex legal protection and risk fragmentation with major negative consequences for all stakeholders.

Advanced digital technologies are now available to support new financial and contractual models for investment planning, risk management and collaborative project delivery; and the industry is now facing a “chicken and the egg” dilemma:

- The current investment planning and contractual practices de-motivate investments in the use of advanced technologies that would reduce project cost, schedule and risk; but,
- The current business practices will not be changed unless new technologies can change investment planning, risk management and can provide the necessary collaborative environment for project delivery.

A growing number of leading organizations launched successful business transformation projects but the industry transformation process is very slow and limited to island of success.

A strong industry association of investor, financial, insurance engineering and construction organizations and digital technology providers can create the necessary critical mass for a large scale transformation process and CERF / CAB\(^1\) is the best positioned to take this role by:

- Motivating support from owner/operator organizations and governmental funding agencies;
- Facilitating and stimulating pilot projects and evaluating the results;
- Making the lessons learned and knowledge available to CAB member organizations and to the whole industry.

2. Fundamentals of the Industry Crisis

Contracting and project delivery practices that are no longer acceptable

Almost any construction project is a high risk for its investors. In the absence of a better solution the industry has evolved project delivery processes based on a perceived need for corruption avoidance, including complex legal protection, leading to risk fragmentation with major negative consequences:

- Higher project risk;
• Low and decreasing profit margins for engineering and construction organizations in spite of the growing cost for investors and owner/operator organizations;
• Decreasing productivity or at best very low productivity growth;
• Delivery of a design data structure that is in conflict with the construction business structure; this makes construction a high risk process;
• Delivery of a design data structure that is in conflict with the facility operations and maintenance process, making this process a life long complex and expensive business for owner / operator organizations;
• De-motivation for innovation and collaborative project delivery.

In contrast and as an obvious resource we have proven examples from the aerospace, automotive and shipbuilding industries of better contractual models and better project delivery processes enabled by advanced digital technologies.

**Broken value chain along the facility life cycle**
Design and construction are cost components for owner / operators and not components of the production and / or service value. Facilities are cost centers for owner/operator organizations; value results from producing power, cars, oil, chemicals, etc.

• Design organization cannot profit from value in construction;
• Construction organization cannot profit from value in facility operations and maintenance;
• Operations and maintenance cost cannot be measured against facility equipment and systems performance;
• Equipment and systems suppliers cannot benefit from performance and availability for lifetime;

3. A summary of the Industry Problems

3.1. Investor and Owner / Operator View

*Project Risk pressure* - Every construction project is too high risk for investors and owner / operator organizations;

– Cost risk: budget overruns due to design errors and miscommunication among subcontractors that are discovered too late in construction;
– Late to Market Risk: schedule slippages, a high risk in construction;
– The risk of not meeting facility performance objectives, normal operating conditions and emergency conditions;
– The risk of higher operations and maintenance cost.

The high cost of operations and maintenance that cannot be measured against facility equipment and systems performance and reliability.

– Business model based on “time & material” contracts, purchasing man–hours;
– Business model based on individual knowledge; no motivation for the development of shareable corporate knowledge;
– The current “site centric business process” does not provide the economies of scale; the cost of implementing advanced solutions for one site is not economically
sustainable;
– Design data structure is in almost total conflict with the business structure and this makes operations and maintenance a labor intensive process;
– Million dollar investments for equipment and systems monitoring (instrumentation and controls) are not effectively deployed and used in facility operations and maintenance.

**Economic Pressure** – Economic pressure comes from the imperative need to link plant management cost with plant equipment/systems performance, reliability and safety. The absence of this link keeps plant management cost high in spite of the fact that profit margins for engineering service providers are low.

**Business Globalization Pressure** – Advanced digital technologies have enabled benefits from the globalization of all business processes, except the local, plant-centric operations and maintenance processes. Today, over 80% of the large chemical producers already have supply chain management solutions in place. This has created a growing pressure for a similar investment in digital technologies for plant lifecycle management processes. The current plant oriented business model is an obstacle to global collaboration at corporate level and global collaboration with suppliers of facility equipment and systems, and suppliers of services.

**Work Force Pressure** – Work force pressure evolves from the decreasing number of skilled resources in plant operations, monitoring and maintenance. The current dominance of individual know-how in this business will have to be replaced by re-usable and shareable corporate know-how or business process templates. The use of advanced digital technology (Web-based communication, remote monitoring/diagnostics, and intelligent graphics) will enable the development of a network of plant expertise centers supporting a large number of plants and reduce the number of engineering personnel required on-site.

**Technology Pressure** – Over the past 30 years, the chemical, process and manufacturing industries have made large capital investments to automate industrial processes and install instrumentation for plant equipment and systems. This has created growing pressure for an equivalent level of digital plant operations and maintenance processes. The combination of Web-based communication, remote monitoring and intelligent graphics can integrate a plant’s virtual and physical attributes, and place any plant in the world “a click away” from a plant maintenance center of expertise. This provides huge benefits for global companies wherein collaborative engineering as well as efficiencies of scale are critical success factors.

3.2. **Construction View**

In spite of the fact that construction is the highest risk component of investing for new production and service facilities, construction planning is not properly addressed in the early phase of investment planning and contracting.

Design data structure is not properly addressing the construction needs. Almost any engineering organization can design in 3D but the industry is still dominated by electronic drawing production. Construction is a 3D reality when design still is a 2D business.
3.3. Architect and Designer View

Low and decreasing profit margins in design; 1% to 5% is reported as current average margin for mainstream projects.

Risk fragmentation practice creates ‘silos’ of business objectives with very low motivation for collaboration among subcontractors in design.

Not much room for innovative architectural design; the cost and schedule penalties for better architectural design is high unless a better modeling technology can support:

- Better communication of the design intent to all trades, and
- Automation in the fabrication of building components;

Most engineering and design organizations can deliver 3D design with a lot higher value for construction and operations but still motivated to keep in place the old drawing production practice. In essence, design is “time and material business” revenue measured by required labor for the scheduled drawings.

3.4. Suppliers View (Suppliers of Facility Equipment, Systems and Pre-fabricated Components)

The profit margin for suppliers, high in the past, is now a lot lower and decreasing. Suppliers face production overcapacity and now look for ways to increase their service business in supporting lifetime equipment and systems performance and reliability;

Many suppliers are now capable to deploy remote monitoring of large fleets of equipment and systems to create the economies of scales. The problem is that this demands new financial and contractual models in facility operations and maintenance.

4. Industry Transformation: Enabling Technologies

As proven by all the other industries and service sectors, the advanced digital technologies will be a major ingredient and success factor for the construction industry transformation;

4.1. Technologies enabling better Risk Management, Contracting and Project Delivery.

- Model & Simulation based Investment Planning and Project Delivery Coordination;
- Global Collaborative Environments for the supply chain.

4.2. Technologies enabling better construction planning and execution.

- Model & Simulation based Digital construction process planning. Large scale 3D design is not sustainable unless driven by 3D construction process planning starting from the early phase of investment planning;
4.3. Sustainable 3D Engineering and Design.

- Most engineering organizations are capable of delivering 3D design; the problem is that 3D design for drawing production only is not economically sustainable. As already proven in the manufacturing sectors, 3D for Construction / fabrication / assembly add the necessary value that motivates large scale deployment of 3D, including supply chain.

- The Manufacturing segment of the construction industry (suppliers of facility equipment, systems and pre-fabricated components) is ahead of facility design in adopting 3D and this is a major component of facility design readily available if proper integration can be supported.

4.4. Technologies enabling new business models in facility operations and Asset Lifecycle Management.

- Remote monitoring and web-based support services for large fleets of facility Equipment and Systems to replace the current labor intensive site / facility – centric model; this will provide the economies of scale for sustainability;

- Re-usable Digital know-how: parametric digital definitions of facility equipment and systems to connect manufacturing / fabrication with the after market services;

5. Target Industry Segments

Construction industry transformation will be an owner / operator driven process and this motivates launching transformation projects that address both segments of the industry:

- New Investments: Improved Investment Planning and Project delivery coordination for new facilities and / or modifications of the existing ones;
- Operations and maintenance of the existing production and service facilities, by far the largest business segment;
The Honorable Don Young  
Chairman, House Committee on Transportation and Infrastructure  
2111 Rayburn House Office Building  
Washington, DC 20515  

Dear Chairman Young:  

As the conferees complete work on the “Transportation Equity Act: A Legacy for Users” (TEA-LU), I wanted to express support for a proposal that would transform infrastructure construction and maintenance, potentially saving taxpayers billions of dollars.  

As the founder of the Congressional Modeling and Simulation (M&S) Caucus, I am very interested in promoting the use of this technology in improving military training and readiness. M&S offers safe and innovative solutions to complex military training challenges. Its interoperability, reuse, and affordability hold the potential to revolutionize warfighting capabilities. The Members of the Caucus recognize the potential of this technology, not only for training our armed forces, but for the development of cutting edge weapons systems, as well as civilian aviation and shipbuilding. By fostering the development of the M&S industry, we can improve U.S. competitiveness and create high-paying jobs.  

I am particularly intrigued by the untapped potential application of M&S to building and infrastructure construction. The automotive, shipbuilding and commercial aviation industries have followed the lead of the defense industry in adopting M&S. However, the construction industry has failed to utilize this technology.  

Nationally, construction is a trillion dollar a year business. But, while U.S. productivity has made significant gains over the last few decades, the construction industry has actually lost productivity. Construction’s low productivity costs the U.S. economy more than 1.35 trillion dollars a year. The industry’s archaic approach to design and development costs taxpayers billions of dollars in overruns and delays on major infrastructure projects.  

The efforts to transform the construction industry through adoption of M&S technology are promising. TEA-LU represents a singular opportunity to spur this transformation. The proposed “Demonstration of Digital Project Simulation” provision would create a public-private demonstration of the use of M&S technology in large transportation projects. These projects will save hundreds of millions of dollars through the use of this technology, which, would then
be available for other transportation projects in the states that participate in the demonstration program. This initiative will facilitate the widespread adoption of this technology by the transportation construction industry, as well as other federal departments.

I support inclusion of the “Demonstration of Digital Project Simulation” provision in the final version of the TEA-LU bill. Enactment of this proposal will:

- improve the productivity of the construction industry;
- reduce the taxpayer cost of infrastructure projects while expediting their completion;
- create high-paying technology jobs; and
- enhance U.S. competitiveness.

Thank you for your consideration of a modeling and simulation demonstration program as part of the TEA-LU conference report.

Sincerely,

J. Randy Forbes
Member of Congress
September 22, 2005

The Honorable Don Young
Chairman, House Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Young:

We would like to express our appreciation on behalf of the civil engineering community for your efforts to enact SAFETEA-LU (PL109-59). The federal programs this authorizes are critically important to the infrastructure of the nation on which we have been providing our own report cards for the last ten years (see attached). It has become apparent that a focused effort to address the fragile condition of all the subsets of that critical infrastructure is needed, as evidenced by the tragic impact of Hurricane Katrina.

We certainly understand that the estimated costs create a real question of affordability of bringing the infrastructure up to a realistic and necessary level of resilience and reliability even under normal conditions. We are working with all of the design, construction, and facility owner/maintainer industry to find breakthrough productivity enhancements and innovations and seeking ways to get them to market. That is why we are appreciative of the leadership you have shown in launching a construction industry transformation initiative through Section 10210, "Demonstration of Digital Project Simulation," of the SAFETEA-LU.

The American Society of Civil Engineers (ASCE), a non-profit 501(c)3 professional engineering society with a membership of more than 137,000 is well-positioned to support this initiative. There is a wealth of evidence that the design and construction industry is capable of developing and deploying advanced digital technologies to support design, construction and operations. A key challenge is to drive the deployment of such efficiency-generating technologies down into the small and mid-size firms, and across the industry into all sectors. An owner-driven transformation process will make this deployment sustainable and economically meaningful.

We applaud your leadership in motivating support from some of the largest providers of advanced digital technologies and other creative technology organizations, and we see the partnership between these organizations and the owner/management chain for infrastructure as an excellent way to create the momentum for the initiative. ASCE looks forward to collaborating with the partners in this initiative.

Sincerely yours,

William H. Henry, PE, FASCE
President

ASCE
American Society of Civil Engineers

William P. Henry, P.E., FASCE
ASCE President
September 21, 2005

The Honorable Don Young
Chairman, House Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, DC 20501

Dear Chairman Young:

The new Transportation Act “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users” (SAFETEA-LU) is a significant milestone for the transportation industry. Your initiative to motivate the construction and transportation industry to adopt advanced digital technologies for the planning, execution and maintenance of large transportation construction projects will have long-term benefits to this industry and all users. This initiative will bring the construction industry at least equal to the automotive and aerospace industries, which have long embraced digital technology to reduce time and cost, as well as provide the basis for the long term maintenance of the items built. Additionally, this technology will provide a foundation for other interested users, including Homeland Security, Emergency Preparedness and State and Local Governments. Many other applications and uses will be developed from this foundation.

For over 15 years, my organization has been engaged in delivering digital engineering solutions to the automotive, aerospace and manufacturing industries throughout the world. As we have evolved into the world’s leader in providing digital engineering services, we have certainly learned and brought forward the benefit of these technologies to many of our clients. Today, we are involved with the Destiny USA project. In this context, we learned about your initiative of meeting the executives of the largest technology providers to motivate their support for the transportation construction industry transformation. We fully support Destiny’s vision. It will take an owner/operator similar to this and the US Government to initiate and complete the transformation process. This new paradigm will be incredibly powerful for dealing with infrastructure issues such as those created by Hurricane Katrina and other natural or man-made disasters.

I admire your leadership in launching this transformation and paradigm shift for this industry. We would be delighted to support this transformation movement that you have initiated through SAFETEA-LU. We believe in the value that not only will be driven to the industry but to the end users – all of us.

Sincerely yours,

Timothy P. Hayes
President & CEO
September 12, 2005

The Honorable Don Young
Chairman, House Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Young:

I take this opportunity to express my admiration for your leadership in launching a construction industry transformation initiative through the recent new legislation, the “Safe, Accountable, Flexible, Efficient Transportation Equity Act:: A Legacy for Users” (SAFETEA-LU) legislation, and in particular Section 10210, “Demonstration of Digital Project Simulation.”

As far as I am aware, this is the first instance of legislation that recognizes the critical role digital simulation can play in resolving problems the American construction industry is confronting today. I strongly believe that your effort of motivating support from some of the largest technology provider organizations (such as IBM and Microsoft) is the right approach to create the necessary critical mass for a sustainable process of industry transformation. The construction industry is definitely lacking in implementation of digital technology, which could bring great opportunities to the American economy if properly implemented. This is particularly true in light of the vast infrastructure reconstruction efforts our country must undertake in the aftermath of Hurricane Katrina.

For over twenty years my organization has been engaged in deploying technologies for the construction industry, and we have learned that what is really missing is the owner/operator-driven approach for industry transformation. In the late seventies we participated in an ERDA (Energy Research & Development Administration—predecessor of D.O.E.) funded project for digital construction support of nuclear power stations. Unfortunately, as you know, the nuclear industry did not do very well after Three Mile Island. To my knowledge, a similar effort on that scale has not been done in this country.

We will be delighted to support the transformation movement that SAFETEA-LU can trigger, starting with a number of large-scale pilot projects.

Sincerely yours,

Amadeus M. Burger
President
Dear Chairman Young,

It is with great pleasure that I am accepting your invitation to join you at the September 27th working session regarding the use of technology to enable dramatic improvements in the construction industry. I am honored to have been invited and I am delighted to have the opportunity to engage my organization in addressing the specific needs of this complex industry.

Before going any further, I would like to express my deep sorrow about the terrible tragedy hurricane Katrina has brought to the people of a great American region. Your concern about the state of America’s transportation infrastructure resonates even louder when you witness the heartbreaking images of the devastated areas.

I hope that during our meeting we will have the opportunity to discuss the deployment of digital technologies to support the reconstruction of the infrastructure in this region. A concerted and aggressive effort to deploy advanced technology in the construction industry, and in particular in transportation projects, could save the US economy billions of dollars in reconstruction efforts for this disaster alone, and would allow devastated communities to rebuild and resume a normal life faster than it would otherwise be possible. Equally important, it would create the ability to limit the damage from future disasters through advanced design of new infrastructure projects, and to increase even further the level of preparedness in emergency response.

I admire your leadership in launching this effort, and I am looking forward to meeting you in Washington DC…

Sincerely,

Bernard Charles
President and CEO
September 12, 2005

The Honorable Don Young  
Chairman, House Committee on Transportation and Infrastructure  
2165 Rayburn House Office Building  
Washington, DC 20515

Dear Chairman Young:

The new transportation Act, “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users” (SAFETEA-LU) is excellent news for the construction industry.

Your initiative to motivate the industry into adopting advanced digital technologies for the planning and delivery of large construction can trigger a massive movement that can include energy, Homeland Security, and construction projects for all industrial and service sectors.

My organization has been engaged, for over twenty years, in delivering advanced technologies and solutions for the design, analysis and real-time operation of mission critical electrical power distribution systems, and we are one of the many organizations contributing to the success of the Destiny USA project.

In this context we have learned about your initiative of meeting some of the executives of the many of the largest technology providers in order to motivate support for the transformation of the construction industry. We agree with you that this is a great way to launch a sustainable transformation process for this very complex industry.

Sincerely,

Adib M. Nasle  
President