Our Transportation Future -

A Much Different Course from Point A to Point B

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The wisest of people or institutions seldom can deduce, on their own, that change is needed. And if they do, they never muster the courage to act on that need.”

Bob Lutz, former senior executive, General Motors Corporation
Our Customers say..

- It costs too much
- It takes too long
- Problems still exist
- “When you finally get out there, you tie up traffic for years!”
Transportation... A Business Perspective

- Revenue (funding) has been flat and unpredictable
- Infrastructure repair backlog increasing
- Unit cost to build / repair is ever-increasing
- Workforce is level or decreasing
- Low customer support / trust
- Low innovation level

Signs of business failure
Transportation Infrastructure Is Too Costly

Our customers are unwilling to pay the current price for improvements

We now compete directly with education, the elderly and health care for the taxpayers’ dollars
Since 1964, “design and construction” has been the only industry to actually grow less efficient. Transportation is the least innovative sector of the American economy.

U.S. Bureau of Labor Statistics
Are We Too Big Too Fail ??

When will we get our next bailout?

The transportation lost decades..... the abyss of finance-focused discussions
Transforming our Business
.....Changing Course

“Reform before Revenue”
Focus on The Customer

- We will never convey the technical problem!
- Make “transportation” a social problem

- Communication should be continuous
- We’ve become our own audience
Vision

• Clearly state what we are trying to achieve... and why.

• Describe what we want the transportation system to look like and how it will build communities and business

• Avoid describing vision in terms of projects
Value

• Create value through leadership and relationships
• Focus on adding value
• People pay attention to what they value
Innovation Is Key To Our Business Turnaround

……… Critical Business Need

Move Up the Value Chain

Innovation Applied

Value

Agencies
Transportation Cannot Remain Insular
Technology and innovation used in other sectors must infiltrate and permeate transportation

DOT's, Transit Agencies, Contractors, Engineering Firms, Planners, Universities

Transportation Industry

Efficient Technology Transfer Missing Link

Private Sector Industries / Services

Manufacturing
Telecommunications
Tourism / Service
Food Services
Logistics
Retail
Fashion
Electronics
Music
Bending the Cost Curve

Reducing the cost of infrastructure is critical as public resources become scarce.

More expeditious application of new technology and innovation is the key to bending the cost curve.

Opportunity and Challenge for Innovation and Creativity
Focus on Product not Process

- Accelerate project delivery
- Revamp business processes
- Concentrate on value, not volume of paper, not on process
Creativity

• Plain vanilla solutions aren’t good enough anymore
• Unleashing creativity is empowering
• People respond to ingenuity
Passion

- People respond to passion, not equations
- People respond to **ACHIEVEMENT**

*You cannot light the fire of passion in someone, if it does not burn within us*
Personal Rapid Transit (PRT)
Autonomous Vehicles
Electric Dual Mode Transport
Electric Dual Mode Transport
3-D Printing

1. The CAD model
2. Converting the Object into ‘slices’ of data for the machine
3. Sequentially sending the data to the machine
4. Building the physical object

- Printer head sprays binder selectively
- Device pushes material onto build chamber
- Build Chamber
- Powdered material
- Solid material
Predictive Analytics – Big Data

ION TRANSPORT IN UNSATURATED MEDIA

MOISTURE TRANSPORT

CHEMICAL EQUILIBRIUM MODULE

\[ j_i = -wD_i \text{grad}(c_i) - \frac{D_i z_i F}{RT} wc_i \text{grad}(\psi) \]

\[-wD_i c_i \text{grad}(\ln \gamma_i) - \frac{D_i c_i \ln(\gamma_i c_i)}{T} w \text{grad}(T) \]

\[-c_i \frac{D_w \text{grad}(w)}{} \]

\[ \frac{\partial w}{\partial H} \frac{\partial H}{\partial t} + \frac{\partial w}{\partial T} \frac{\partial T}{\partial t} = \text{div}(D_{mH} \text{grad}(H) + D_{mT} \text{grad}(T)) = 0 \]

\[ K_m = \left( \prod_{i=1}^{N} c_i^{\nu_{mi}} \gamma_i^{\nu_{mi}} \right) \text{DISSOLUTION/PRECIPITATION} \]

\[ K_{SS} = \frac{(C_{ss})^2}{(C_{ss})^2/|z|} \frac{X_{ss}}{X_{Friedel}} f_{ss} \text{SOLID SOLUTION} \]

Deck corrosion initiation probability

Repaired surface: 133.2 sq.m (31%)

Time: 30 y

Repaired surface: 34.74 sq.m (8%)

Time: 30 y
Adaptive Traffic Signal Systems
Dynamic Sign Messaging

Atlantic City Airport – Use Exit 9
10 Miles

AC Airport – Use Exit 9
10 Miles

Atlantic City Airport
Spirit Flight 906 – Delayed
45 Mins.

Exit 5
Right at Signal – 1 mi

A.C. Airport
Exit 9 – 10

EAT AT JOE’S
Exit 5