Meeting of the Governor’s Council on Climate Change (GC3)
October 19, 2016
Agenda

1:30 Welcome and Announcements
   DEEP Commissioner Klee

1:35 GC3 Milestones and Timeline
   Keri Enright-Kato, CT DEEP

1:50 Overview of Let’s Go CT Initiatives: Impacts Vehicle Miles Traveled
   Tom Miazarz, Department of Transportation

2:15 Energy Efficiency Scenario – A Look at Implementing Deeper Energy Efficiency Measures
   Julia Dumaine, CT DEEP and Jason Rudokas, NESCAUM

3:00 Public Comments
GC3 Milestones and Timeline
GC3 Milestones: 2015-2016

July 10, 2015 GC3 launch

18 meetings to date (GC3, LAE & ADM working groups)

3 Public Stakeholder Engagement Events – reaching approximately 500 people.

March 2016 release of the GC3 Exploratory Report

Over 25 DEEEP speaking engagements in which the work of the GC3 was highlighted.

24 webinars in our Exploring Climate Solutions Series – with over 700 participant views.

Development of reference case (includes the review of reference case inputs and assumptions)
## Timeline: 2016-2017

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<tbody>
<tr>
<td>Refine and finalize GHG reduction scenarios in LEAP.</td>
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<td>Economic Analysis of Scenarios (REMI).</td>
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<td>Review and discuss midterm target(s) and policy options for achieving GHG reduction targets.</td>
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<td>Develop a policy narrative around GHG mitigation scenarios.</td>
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### Upcoming Meetings:

- **GC3 Meeting November 14, 2016**  3:00 – 5:00 PM
- **GC3 Meeting December 15, 2016**  1:30 – 3:30 PM
Overview of Let’s Go CT Initiatives: Impacts Vehicle Miles Traveled
Connecticut’s Vision & Strategy for a Transportation Future

• Vision & Strategy

• $100 billion capital program

• Overview of full program,
  o focus on NY – New Haven corridor for illustration

Governor’s Climate Change Council
October 19, 2016
‘Best in Class’
transportation system vision

- **Multimodal:** must offer choices and connectivity among modes
- **Safe:** safety must top priority on all modes
- **Good Repair:** priority must be to fix what we already have
- **Congestion:** problem must be addressed.
- **Environment:** must be protected.
- **Livable & sustainable communities:** transportation must support livable & resilient communities
- **Economic Growth:** transportation must support economic growth
$100 billion capital cost

What’s included? How did we develop it?

Statewide assessment of infrastructure preservation needs

Preservation (State of Good Repair) = \( \frac{2}{3} \)ths

(Expansion or Enhancement = \( \frac{1}{3} \)rd)

Regional strategies to address special needs & opportunities

Transportation system needs

Economic opportunities
Infrastructure Preservation
($62 billion)

• Why is it such a large % of program?
• Why is it so critical?
Why is $62 billion needed for preservation?

CT has an extensive multimodal system that is old & used intensely.

- Highway Facilities: $1.0 B
- Guiderails+: $4.6 B
- Traffic Signals+: $2.5 B
- Highway – other items: $1.6 B
- Rail Bridges: $5.3 B
- Rail Fleet: $2.2 B
- Rail Track: $3.5 B
- Rail Facilities: $3.5 B
- Highway Pavement: $5.4 B
- Highway Bridges: $24.6 B

PLUS: airports, water ports, freight, bike & pedestrian systems
Our Transportation Infrastructure Is Large & Diverse

Challenge: Keeping it operating, in good condition, & safe is a major challenge

Highway System:

Heavily used highway network
- 85 million vehicle miles traveled daily
  - 100,000-180,000 cars & trucks daily on I-95, I-84, I-91
- 21,500 miles of state & local roads
- 7,400 state & local bridges
- 50 state highway maintenance garages
- 630 plow trucks

Transit System

Nation’s busiest commuter railroad
- 40+ million rail passenger trips per year
- 225 miles of passenger railroad
- 203 bridges on New Haven Lie
- 500 rail coaches & cars
- 40+ million bus passenger trips per year
- 1,100 buses & paratransit vehicles
70% of CT’s highway bridges were built in 1950s & 60s or earlier.
# Highway Bridges in Poor Condition

Reflects recent increases in bridge program
What’s in the $100B program?

Statewide Programs

(preservation & enhancement)
Statewide *Highway & Bridge* Preservation Programs

**Bridge** preservation program
- $25 Billion over 30 years

**Pavement** preservation program:
- $7 Billion over 30 years
Statewide *Bus* Program

- **Urban Bus Service:** Improve & expand urban bus service by 25%
  - provide residents bus service within half-mile
- **Integrate services:** operating services, info, & customer service statewide
- **Service & info. delivery:** real-time information & smart card fare collection
- **Bus maintenance facilities:** upgrade
Statewide Bike & Pedestrian Programs

• **Design for Bikes & Pedestrians.** Support livable & walkable communities:
  - complete streets policy

• **Community Connectivity ($10 M/yr)**
  Create program to improve conditions for pedestrians in community centers.

• **Trail Program ($10 M/yr)** Create program to fill gaps in trail system & maintain trails.
Statewide **Ports & Maritime** Program

- **Port Authority.** Create Authority to advance freight, intermodal, commercial, & tourism statewide.

- **3 Deep Water Ports.**
  - Take advantage of rail & highway linkages
  - Renovate & add infrastructure: piers, cranes, warehousing
  - Maintenance **dredging**

- **Local Maritime.** Support local maritime economy across CT.
Statewide *Municipal* Programs

- Increased State program for municipal **roads**
  - from $45M to **$75M** annually
- Doubled State program for municipal **bridges**
- New program for municipal **traffic signal** replacement
Statewide *Freight* Program

- **Rail Freight Improvement Program**: ($10M annually)
  - upgrade freight rail lines across the entire state
- **Bridge upgrades (highway)**. Upgrade to meet 100,000 lb. national standard
- **Overnight Truck parking**. Expand overnight parking for trucks.
- **Electronic Truck permitting**. Automated permitting for wide & heavy loads
- **Intermodal connections**:
  - improve deep-water ports (New London, New Haven, Bridgeport)
  - Improve other intermodal facilities & infrastructure (truck, rail, air)
Transportation Corridors
Multimodal & Regionally-Based Strategies

NY-Hartford corridor
New Haven–MA corridor
Eastern CT
NY-New Haven corridor
New York to New Haven Corridor

Approx. $30 Billion over 30 Years

Key Objectives

- Reduce congestion on I-95 & Rt 15
- Improve rail access to NYC (& within CT)
- Improve mobility & choices
**Highway Investment** - $11 Billion (preservation & enhancement)

- **I-95**: Widen from NY to New Haven
  - Start with most congested segment: Bridgeport to Stamford
  - Institute congestion management practices
- **Major preservation projects** such as:
  - **I-95**: Complete reconstruction of West River Bridge in New Haven
  - **RT 15**: Reconstruct/replace West Rock Tunnel in Woodbridge
- **Fix traffic bottlenecks**: i.e. Rt. 7/15 interchange & Rt. 8 in Shelton-Derby

**Bus Investment** - $40 Million

- Expand bus service – including easier access to rail stations
- Bus Rapid Transit
Rail Investment - $18 Billion (preservation & enhancement)

- New Haven Line:
  - Restore rail infrastructure (movable & fixed bridges, track, catenary, etc.)
  - Improve safety & reliability
  - Reconfigure 4 tracks
    - 2+2 concept: capacity & service enhancement
      - more frequent local “subway” type service on 2 local tracks
      - faster express service on 2 express tracks
    - Add & modernize stations, expand parking

- Branch Lines: Upgrade branch lines to provide full commuter service on 3 lines
  - New Canaan
  - Danbury
  - Waterbury
## 30 Year Rail Needs
**New Haven Line + Branches**

**Approx. $18 Billion**

### State of Good Repair

<table>
<thead>
<tr>
<th>Initiatives</th>
<th>$</th>
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<tbody>
<tr>
<td>Bridges <em>(fixed &amp; moveable)</em></td>
<td>$5,000 M</td>
</tr>
<tr>
<td>Track</td>
<td>$1,980 M</td>
</tr>
<tr>
<td>Fleet</td>
<td>$1,750 M</td>
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<tr>
<td>Stations &amp; Parking <em>(existing)</em></td>
<td>$1,500 M</td>
</tr>
<tr>
<td>Maintenance Facilities &amp; Yards</td>
<td>$1,460 M</td>
</tr>
<tr>
<td>Communications &amp; Signals</td>
<td>$1,120 M</td>
</tr>
<tr>
<td>Catenary &amp; Power</td>
<td>$700 M</td>
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**$13.5 Billion**

### Enhancements

<table>
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<tr>
<th>Initiatives</th>
<th>$</th>
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<tbody>
<tr>
<td>2 + 2 Service Improvements</td>
<td>$2,000 M</td>
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<tr>
<td>Branch Line Enhancements</td>
<td>$1,335 M</td>
</tr>
<tr>
<td>Fleet Expansion</td>
<td>$500 M</td>
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<tr>
<td>Maintenance Facilities &amp; Yards <em>(new)</em></td>
<td>$100 M</td>
</tr>
<tr>
<td>Amtrak Layover Facility</td>
<td>$500 M</td>
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<tr>
<td>Stations &amp; Parking <em>(new)</em></td>
<td>$200 M</td>
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**$4.6 Billion**

**Total: $18 Billion**
## NHL Program Spending – Next 5 Years

<table>
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<tr>
<th>Description</th>
<th>Cost</th>
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<tr>
<td>Normalized State of Good Repair Program</td>
<td>$554 million</td>
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<tr>
<td><strong>Major State of Good Repair Projects</strong></td>
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<tr>
<td>Walk Bridge Program</td>
<td>$900 million</td>
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<tr>
<td>Rolling Stock</td>
<td>$733 million</td>
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<tr>
<td>Signal System Replacement</td>
<td>$238 million</td>
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<tr>
<td>Positive Train Control</td>
<td>$170 million</td>
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<tr>
<td>New Haven Yard Improvements</td>
<td>$95 million</td>
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<tr>
<td>Atlantic Street Bridge Replacement</td>
<td>$93 million</td>
</tr>
<tr>
<td>Stamford Track 7</td>
<td>$39 million</td>
</tr>
<tr>
<td>Noroton Heights Platform Replacement</td>
<td>$12 million</td>
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<tr>
<td>Network Infrastructure Phase 2</td>
<td>$12 million</td>
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<tr>
<td>Other projects (4)</td>
<td>$30 million</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>$2.9 Billion</strong></td>
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Recent progress on New Haven Line

- 2014: most significant service increases in the history
  - 246 to 304 daily trains
  - off-peak & weekend 30-minute service
  - net positive revenue
- Moving from “commuter” railroad to “rapid transit”
- Improved reliability
- Complaints at record low
- Ridership at record high, outpacing all forecasts
Measuring the Economic Value of major transportation investments in *Let’s Go CT*
Positive Economic Impacts

I-95 Widening Program
Part of multimodal strategy to manage congestion & promote economic growth

$11.4 B added business sales & output (30 yrs)
$13.9 B added business during const.
3,300 permanent jobs.
6,700-26,000 construction jobs.

NHL Capacity Improvements
Part of multimodal strategy to manage congestion & promote economic growth

$6.2 B added business sales & output (30 yrs)
$9.1 B added business during const.
2,000-3,000 permanent jobs.
4,000-6,000 construction jobs.
Positive Economic Impacts

2 primarily preservation projects

I-84 Viaduct
Hartford

$10.2 B  added business sales & output (30 yrs)
$7.3 B  added business during construction
2,500-3,500  permanent jobs
3,000-7,000  construction jobs

I-84 Mixmaster
Waterbury

$8.8 B  added business sales & output (30 yrs)
$10.4 B  added business during construction
2,000-3,000  permanent jobs.
6,000-11,000  construction jobs
Thank You
Energy Efficiency Scenario – A Look at Implementing Deeper Energy Efficiency Measures
Advancing Emissions Reductions Through Energy Efficiency

Strategies

▪ Achieve increasingly targeted and deeper energy savings in our buildings through whole building-system approaches
  – Home Energy Solutions, Energy Conscious Blueprint, and more
▪ Leverage investments through efficiency financing and project brokering
  – Lead By Example, C-PACE, Smart-E Residential Loans
▪ Implement and enforce stronger building codes and high performance standards
▪ Promote sustainable energy management as a core value
Energy Efficiency Is a Low-Cost Energy Resource

Source: Moline, Maggie (March 2014) The Best Value for America’s Energy Dollar: *A National Review of the Cost of Utility Energy Efficiency Programs*
Energy Intensity of Electricity Consumption

Electricity Consumption: Thousand BTU Per Person

13% reduction in electricity consumption per person from 2005

Source: EIA State Energy Data System, 2016
Residential, Commercial and Industrial Energy Consumption Trends

Northeast states use energy more efficiently compared to other regions.

Source: EIA State Energy Data System, 2016
Residential, Commercial and Industrial Energy Consumption Trends

- Declining trend since early 2000s
- Trend is flattening out for most Northeastern states
- How much further down can this trend go and at what cost?

Source: EIA State Energy Data System, 2016
Energy Intensity of CT Gross State Product

Source: EIA SEDS data

29% reduction in electricity consumption per $ of GSP
Economy Wide Energy Consumption Trends

- Consumption per $ Gross State Product
- Declining trend since early 2000s
- Trend is flattening out for most Northeastern states
- How much further down can this trend go and at what cost?

Source: EIA State Energy Data System, 2016
CT Energy Savings Are Growing Through Increased Energy Efficiency Investment

Annual Energy Savings (% of Sales)

Source: Connecticut Energy Dashboard
Energy Efficiency in CT Reduces Emissions

Source: CT Energy Efficiency Board Annual Legislative Reports
Beyond the C&LM Fund: Lead By Example (LBE)

Connecticut General Statutes 16a-37x:

- Energy Savings Performance Contracting (ESPC) program for use by state agencies and municipalities
- Implement portfolio of comprehensive energy savings measures with minimal upfront capital
- Uses a list of pre-approved Qualified Energy Services Providers (QESP’s)
- Guarantees energy savings and utilizes the resulting cost savings as the debt service until paid off (typically about 10-15 years)

CT government facilities make up 15% of the energy consumed in the C&I Sector (electric and natural gas)
Benchmarking and Procurement

Compare energy use to prioritize; Update procurement documents, contract language, and processes.

Inventory Facilities Universe
Data Collection and Correlation

Screening
for potential opportunities and future facility use; feasibility analyses for renewable generation sources.

Energy Assessments
Conduct investment grade energy audits; identify appropriate financing mechanisms.

Efficiency Measures and Renewable energy generation sources financed, constructed and installed, and remain effective into the future.
Measurable Impact of LBE bond funded program

- 56 completed projects to date
- 14 projects are in construction/design phase
- Estimated annual cost avoidance $2.8M
Greenhouse Gas Impacts of State Energy Efficiency and VMT Strategies
Energy Efficiency and VMT Assumptions

▪ Energy Efficiency
  – Reference case programs already achieving a 2.5% reduction in electricity and natural gas demand
  – EE Scenario 1: Total loads reduced by 3.5%
  – EE Scenario 2: Total loads reduced by 4.5%

▪ Let’s Go Connecticut
  – Bus trips up 9,890 trips per day
  – Rail trips up 14,660 trips per day
  – Over VMT reduction of .36%
GHG Reductions in 2030 and 2050

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<th>2030</th>
<th>2050</th>
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<tr>
<td>Let’s Go CT</td>
<td>-0.19%</td>
<td>-0.17%</td>
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<tr>
<td>State EE Programs 3.5%</td>
<td>-1.14%</td>
<td>-1.03%</td>
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<tr>
<td>State EE Programs 4.5%</td>
<td>-1.85%</td>
<td>-1.67%</td>
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• Values represent percentage changes relative to the reference case.

• Smaller changes in 2050 reflect the fact that overall loads/demand is very modestly decreasing in the reference case.
Public Comments