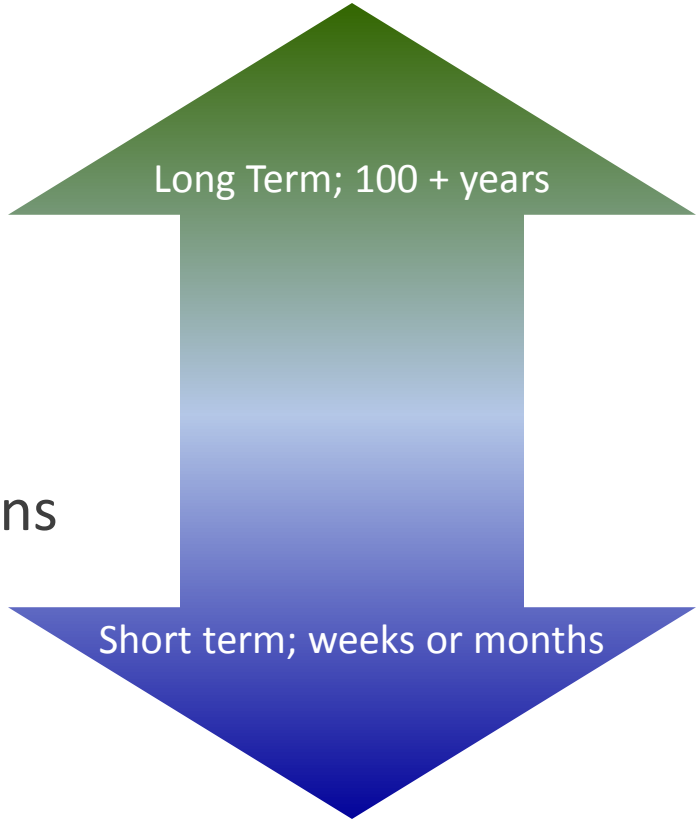
Changing the Way Buildings and Communities are Designed, Built and Operated

Potential Impact

- Infrastructure Development
- Neighborhood Development
- Community Development
- New Buildings
- Renovations
- Optimizing Building Operations
- Programs and Initiatives
- Education



Components of a Plan

Benchmarks

Understanding where you are now

Qualitative Goals

Creating a vision of where you want to be

Quantitative Goals

Ways to measure if you have gotten there

Metrics

Measurement tools that are relevant and useful

How do you get there?

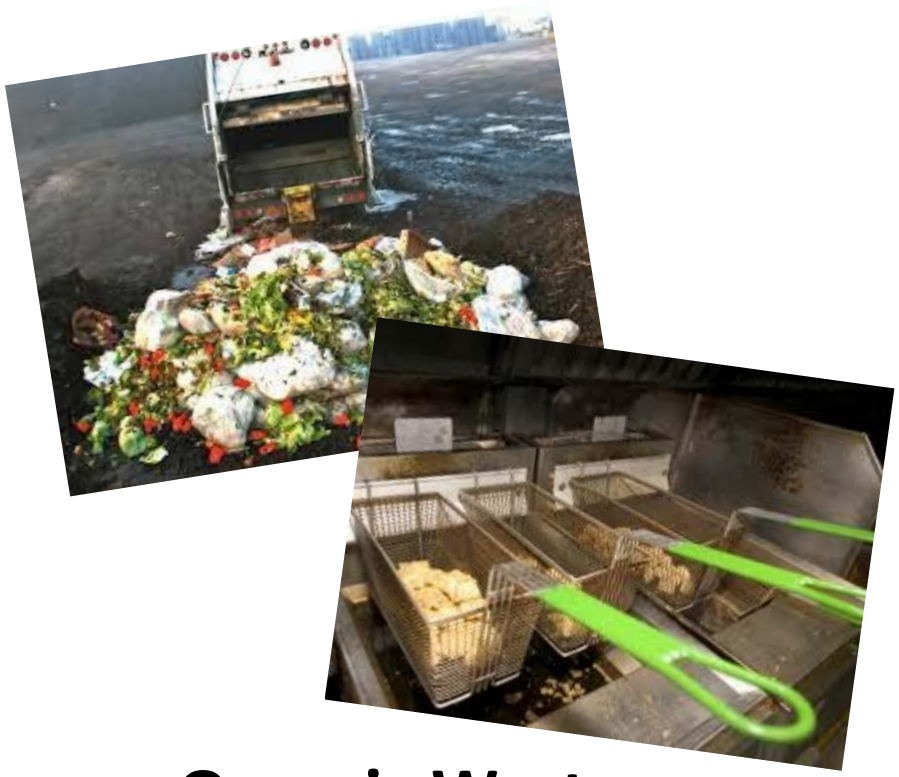
- **Build** a Team for the long term
- **Study** existing conditions, collect as much information as you can
- **Create** a shared vision of what you want to achieve
- **Identify** appropriate goals and metrics
- **Explore** strategies that become part of a plan
- **Communicate** your vision and plan to the community
- **Assess** your progress; periodically tune-up your vision and plan
- **Adjust** - be flexible and take advantage of unforeseen opportunities

Angela Knowles, PP/AICP, LEED AP

Natural Systems Utilities, Market Development Leader

- Leading the world to a new and holistic approach to Organic Waste Repurposing & Water Reclamation
- Reimagining and building infrastructure for a sustainable tomorrow -- today
- Offering Design, Build, Operate and Ownership solutions
- Creating trusted, shared-value partnerships with the people we serve and the earth we are entrusted to protect

Infrastructure



Organic Waste

Wastewater

Green Design in Infrastructure

Organic Waste

Wastewater

Organic Waste Reclamation

Ridgewood Village Sustainable Energy Project

- Optimize operations of an existing wastewater treatment facility
- Convert biogas at the plant to electricity via anaerobic digestion, CHP, and installation of solar arrays to produce additional electricity
- Accept FOGs from local restaurants
- Electricity to operate wastewater treatment plant provided by renewable energy created on-site

Organic Waste Reclamation

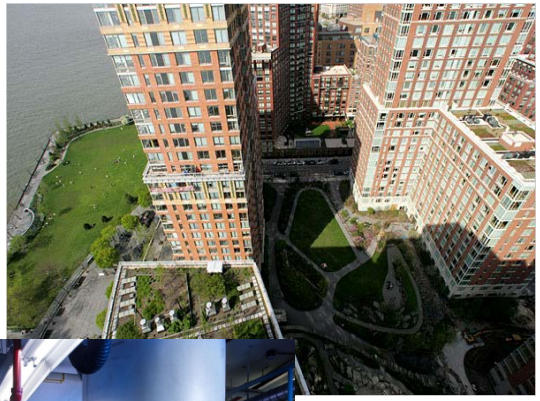
Forest County Potawatomi County, WI

- Renewable energy facility generates 2MW of electricity daily - enough to power approximately 1,500 homes
- Facility treats liquid and solid food waste byproducts from local food and beverage companies
- Diverts waste from landfills and wastewater treatment plants - mitigates up to 87,000 metric tons of greenhouse gas emissions annually (data source from the US Department of Energy)

Water Reclamation

Battery Park City, NYC

- First LEED Gold residential high-rise building (Solaire)
- Battery Park City = 8 Bldgs, 6 systems
- Black water recycling
- Recycles up to 25,000 GPD
- Reuse applications:
  - 9,000 GPD toilet flush water
  - 11,500 GPD cooling tower make-up
  - 6,000 GPD landscape irrigation
- Uses an advanced membrane bioreactor system for high-quality effluent
- 35% less overall energy consumption
- 65% less energy at peak demand
- 50% less potable water used than other high-rise buildings of same size
- Rainwater collection system irrigates 10,000 square feet of rooftop gardens



Water Reclamation

MacDonald Island, Alberta, CA

- Proposed expansion of existing sports complex exceeded capacity of existing centralized collection system required costly infrastructure construction
- Direct water reuse on a district scale will:
  - reduce total indoor potable water use by approximately 30%
  - reduce wastewater flow to centralized facilities by nearly 100%
  - reduce diversion of water from local waterways for golf course irrigation by up to 100%
  - increase stream flow within local waterways
  - capture energy from the treated water before reuse to heat indoor pool facilities

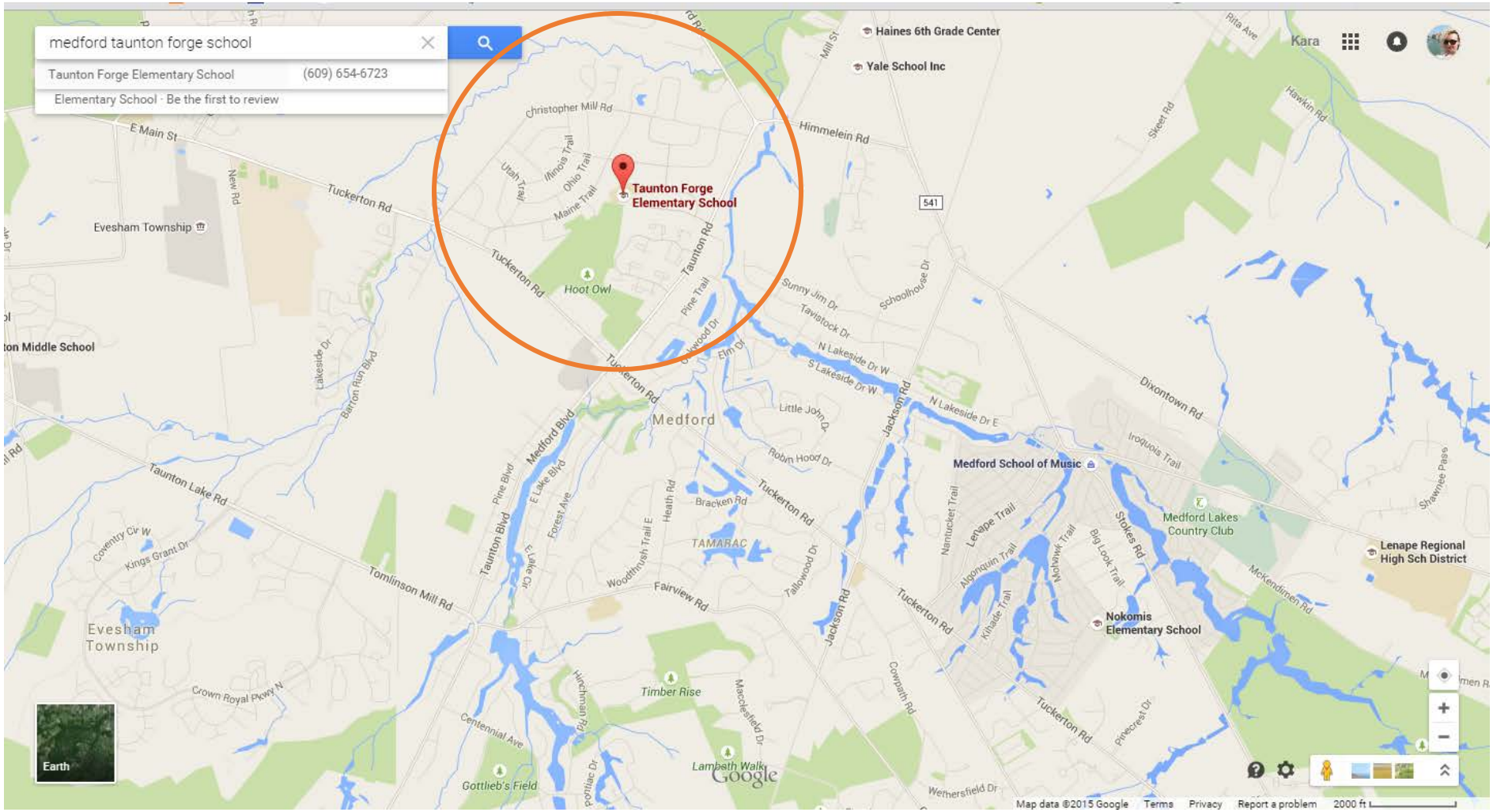
Sustainable Community Infrastructure

1. Inventory the condition of existing infrastructure
   - Will it be able to remain on-line and open for use during extreme weather?

2. Inventory community assets for opportunities to increase efficiencies
   - Schools, Hospitals, Community Centers, WWTPs

3. Think outside the box!
   - Where do you see waste (of any kind) that could be put to use as a resource?

Past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S Lakeside Dr W
Elm Dr
Medford
Little John Dr
Robin Hood Dr
Jackson Rd
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Dixontown Rd
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Medford School of Music
Medford Lakes Country Club
Lenape Regional High Sch District
Nokomis Elementary School
Taunton Lake Rd
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Taunton Blvd
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Bracken Rd
TAMARAC
Woodthrush Trail E
Fairview Rd
Tallowood Dr
Heath Rd
Nantucket Trail
Lenape Trail
Algonquin Trail
Mohawk Trail
Big Look Trail
Kihade Trail
Stokes Rd
McKendimen Rd
Timber Rise
Lambeth Walk
Gottlieb's Field
Centennial Ave
Crown Royal Pkwy N
Coventry Cir W
Kings Grant Dr
Barton Run Blvd
Lakeside Dr
New Rd
Utah Trail
Illinois Trail
Ohio Trail
Maine Trail
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Present

Sandy Hook Elementary School
Newtown, Connecticut

Courtesy of Svigals+Partners

Future-Looking

- ICLEI
- LEED for Neighborhood Development
- Sustainable Jersey
- Sustainable Jersey for Schools

Take Action

- Build a strong team
- Plan for transition
- Use available resources, services, and experts