ECO-AMBASSADORS
SESSION #2

Medford Campus
February 18, 2014
From last session...

- How did your office introduction go?
- Personal Behavior Change Challenge – Challenges? Successes?
- Recycling survey and audit
Today’s Agenda

- Water
- Transportation
- Meetings & Events
- Energy
- Purchasing
Water
WHERE IS ALL THE WATER?

SALTWATER DOMINATES EARTH'S SUPPLY:

97.5% SALTWATER

2.5% FRESHWATER

MOST FRESHWATER IS UNATTAINABLE:

70% IS FROZEN IN POLAR ICECAPS

30% LIES UNDERGROUND (most of which is too expensive to tap into and filter)

LESS THAN 1% of the world's freshwater is available for human consumption

Source: http://awesomegood.is.s3.amazonaws.com/transparency/web/1106/clean-water/flat.html
65 Olympic-size swimming pools

How many gallons of water does it take to make...

- Coffee: 35 – 53 Gallons
- Burger: 4,000 – 18,000 Gallons
- Car: 41,000 Gallons
- Bottle: 1.85 Gallons
Typical office water use

Source: http://www.epa.gov/oaintrnt/water/lab_vs_office.htm
Water Consumption by Campus

Gallons x 1,000,000

Fiscal Year

2006 2007 2008 2009 2010 2011 2012

Grafton
Boston
Medford
Water Reduction Projects at Tufts

- Low flow toilets and urinals
- Dual flush toilets
- Faucet flow restrictors
- Metered faucets
The FACTS about BOTTLED WATER

$0.0015 / gal  $10.00 / gal

The price of bottled water is up to 10,000 times the cost of tap water

Annually, Americans consume 8.6 billion gallons of bottled water

Source: http://www.onlineeducation.net/bottled_water
40% of all bottled water is taken from municipal water sources (a.k.a. tap water).

22% of tested bottled water brands contained chemical contaminants at levels above strict state health limits.
17 Million barrels of oil are used in the production of water bottles yearly...

...enough to fuel 1 Million cars for a year
## Cost of 750 gallons of water*

<table>
<thead>
<tr>
<th>Individual Bottles</th>
<th>Poland Springs 5 gal bottles</th>
<th>Poland Springs water filter</th>
<th>Brita Filter pitcher</th>
<th>Tap water</th>
</tr>
</thead>
<tbody>
<tr>
<td>$762</td>
<td>$565</td>
<td>$264</td>
<td>$232</td>
<td>$13</td>
</tr>
</tbody>
</table>

*750 gallons provides 1 liter of water per day to each person in a 12 person office for one year (work days only).

**Example** (Tisch College):
- Bottled Water = $720
- Filtration System = $384
- Savings per year = about $336, almost 50%
What can you do in your office?

• Use tap or filtered water, not bottles
  – Contact: Scott DeFeo (Nestle Waters N. America)
    (978) 970-5656 x 3031, scott.defeo@waters.nestle.com

• Model sustainable water behaviors

• Report leaks to Facilities –
  – Submit an online service request
    (https://fsrequest.tufts.edu/WebMaint/)
  – Call (617) 627-3496 with emergencies

• Have a water survey for your office

• Hold a water tasting
Transportation
Transportation Facts

- Americans spend **4.2 billion hours** stuck in traffic each year.
- On average, Americans spend nearly **20% of their household budgets** on transportation.
- Transportation is responsible for **28% of greenhouse gas emissions** in the US.
- Between 1995 and 2012, public transportation ridership increased by **34%**.
- In 2012, Americans took **10.5 billion trips** on public transportation.
GETTING AROUND: FUEL USE OF VARIOUS MODES OF TRANSPORTATION

(HOW MANY GALLONS OF FUEL PER PASSENGER DOES IT TAKE TO COVER A DISTANCE OF 350 MILES?)

Cruise Ship
- Capacity: 2315
- Miles per gallon: 0.809
- Gallons per mile: 1.21
- Time to travel 350 miles at 32 mph: 10:56

Amtrak
- Capacity: 300
- Miles per gallon: 0.46
- Gallons per mile: 2.17
- Time to travel 350 miles at 80 mph: 04:22

Boeing 737
- Capacity: 175
- Miles per gallon: 0.42
- Gallons per mile: 2.4
- Time to travel 350 miles at 566 mph: 00:37

Motor Coach
- Capacity: 50
- Miles per gallon: 5
- Gallons per mile: 2
- Time to travel 350 miles at 60 mph: 05:50

Average SUV
- Capacity: 5
- Miles per gallon: 21
- Gallons per mile: 0.48
- Time to travel 350 miles at 60 mph: 03:50

Average Sedan
- Capacity: 4
- Miles per gallon: 27
- Gallons per mile: 0.37
- Time to travel 350 miles at 60 mph: 03:50

Average Hybrid
- Capacity: 4
- Miles per gallon: 46
- Gallons per mile: 0.22
- Time to travel 350 miles at 60 mph: 03:50

Motorcycle
- Capacity: 1
- Miles per gallon: 56
- Gallons per mile: 0.17
- Time to travel 350 miles at 60 mph: 03:50

Bicycle
- Capacity: 1
- Miles per gallon (calorie conversion): 912
- Gallons per mile (calorie conversion): 0.01
- Time to travel 350 miles at 15 mph: 23:28

Walking
- Capacity: 1
- Miles per gallon (calorie conversion): 211
- Gallons per mile (calorie conversion): 0.05
- Time to travel 350 miles at 3.5 mph: 10:00

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Fuel Usage: for driver alone
Fuel Usage: for driver plus one passenger
Fuel Usage: for driver plus three passengers

Whipped cream with cheese is 770 calories. ~God neither endorses or denounces the consumption of Whoppers.

We're Efficient: One gallon of gas equals approximately 31,000 calories. We only need about 2,000 calories a day.

Cyclist: A 175-pound rider, biking 15 miles per hour, and burning: 040 calories per pound per minute.

Walker: A 175-pound pedestrian, walking at 3.5 miles per hour, and burning: 035 calories per pound per minute.

Note: Capacity, fuel economy, and speed numbers are in some cases, averages or estimates. Good is Transparency.

Amount of space needed to transport the same number of passengers by…

- Car
- Bus
- Bicycle
Tufts’ 2010 Emissions (all campuses)

- Heating, 74%
- Electricity, 22%
- Transportation, 4%
- Agriculture, 0.10%
How do Tufts Medford employees get to work?

- Drive Alone: 70%
- Walk: 10%
- Bicycle: 5%
- Bus: 4%
- Subway: 4%
- Carpool: 4%
- Telecommute: 2%
- Commuter Rail/Regional Train: 1%
- Tufts Davis Square Shuttle: 0%
Rider Tools

App Showcase

Where's the T? New apps built by independent developers let you know where your bus or train is and when it will arrive. Check them out below!

Real Time Apps

MBTA mTicket
Buy a ticket anywhere, anytime, in seconds. The Official MBTA mTicket App is like a ticket office in your pocket. The MBTA mTicket App is now available for all Apple devices.

See Say App
If you see something say something for smart phones. Using this app, riders can send the MBTA Transit Police pictures, text messages, and locations of unattended luggage.

Transit - Boston
Find the nearest bus, train, subway or ferry stations with scheduled stops and view upcoming departures with just two quick taps.

App Disclaimer
These apps are not made by MBTA. MBTA does not sell or license the apps. They are written by third parties unless otherwise noted. MBTA shall not be held responsible for the content of third party websites or any issue arising from the use of third party applications. MBTA neither endorses any third party products listed here nor makes any guarantees or representations as to accuracy or reliability. Proceed with care and understand any usage charges that may apply to you. MBTA reserves the right to remove/add applications listings without notice.

Are you a Developer?
Check out the MassDOT Developers page here to gain access to our data.

Want to be included on this page?
Please send a listing to developer@mbta.com with the App Title, Developer Name, Platform, and an image that is 150 X 225 pixels.

MassDOT Developers page
• Tufts membership for $25/year
• $9+/hr., including gas and insurance

More information:
www.zipcar.com/tufts (Tufts employees)
• New bike-sharing system that began in 2011
• 1,000+ bikes at 100+ stations
  – Rent by the hour, day, or year

More information: www.thehubway.com
Emergency Ride Home

- Eligibility: Use a sustainable mode of transportation to travel to work 2+ times/week
- Taxi or rental car reimbursement in event of unexpected personal illness/emergency, unexpected family illness/emergency, carpool driver emergency
- 4 trips/year
• Earn rewards by taking green trips
• Find carpool partners
Ideas for your office

• Walk, bike, take the T or bus, or carpool
  – Share information with others

• Encourage office videoconferencing

• Take the stairs for exercise

• Start an office challenge

• Car-free Week, Bay State Bike Week
Meetings & Events
How could you “Green” these events?

#1 - You are organizing a staff meeting for your office. You need to provide participants with both an agenda and several documents for discussion. Lunch will be provided.

#2 - You are coordinating a large guest lecture for students, staff and faculty from all three Tufts campuses. You need to know how many people are participating in the event and will also have to decorate the lecture hall.
Green Event Checklist

Small In-Office Meetings – Examples include: staff meetings, project meetings, or small office parties

<table>
<thead>
<tr>
<th>Topic</th>
<th>Individual Responsible</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td></td>
<td></td>
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<tr>
<td>Send out invitations and reminders via email.</td>
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<tr>
<td>E-mail out presentations and meeting agendas instead of printing them.</td>
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<tr>
<td>Write the agenda on a white (or black) board or flip chart instead of printing out hard copies for each person.</td>
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<tr>
<td>If handouts are unavoidable, enlarge the margins and print them double-sided. Print in black and white to save money.</td>
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<tr>
<td>Food (if provided)</td>
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<tr>
<td>Provide reusable dishware or ask individuals to bring their own cups, mugs (maybe even plates and silverware) to the meeting.</td>
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<tr>
<td>If disposable is used, provide compostable* or recyclable* plates and utensils.</td>
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<td></td>
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<tr>
<td>Use napkins made from recycled content paper.</td>
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<tr>
<td>If you are providing cups, offer hot cups or plastic cups as they are both recyclable (cold paper cups are not). Provide a marker so that individuals can label their cups for reuse.</td>
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<tr>
<td>Use serving utensils from previous catered events or bring some from home for the day.</td>
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<tr>
<td>If you provide drinks, avoid single-serving beverages by offering drinks in two liter bottles or pitchers.</td>
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<tr>
<td>Avoid excess packaging by providing pitchers or cartons of milk, creamer and sweeteners.</td>
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<tr>
<td>Put out surplus food for students and colleagues and/or remind individuals ahead of time to bring containers to take food home with them.</td>
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<tr>
<td>Provide a compost bin for individuals to compost food waste and designate an individual to bring it to a compost station on campus.</td>
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<tr>
<td>If clean-up is necessary, use green cleaners to clean-up meeting space.</td>
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</tr>
<tr>
<td>Waste</td>
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<td></td>
</tr>
<tr>
<td>Make sure there are recycling bins in the room.</td>
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</tr>
</tbody>
</table>

*compostable and recyclable materials are preferred.
Communication & Collaboration

Conferencing Tools

**Desktop Video Conferencing (Jabber Video)**
Desktop video conferencing allows individuals at multiple locations to interact or share applications via simultaneous video and audio transmissions.

**Telephone Conferencing**
Telephone conferencing (Conferencing Bridge) provides the ability to connect geographically dispersed meeting participants (6-150) on a single phone call.

**Video Conferencing Rooms**
Technology Services maintains conference room format video conferencing capability on all three campuses. Currently, these units are available for meetings, distance learning, and education projects.

**Web Conferencing (Adobe Connect)**
A web video conference uses a combination of video and audio telephony technologies to allow two or more users (or locations) to connect, meet, and collaborate via the Internet.
Energy

- **Electricity**: 33%
- **Transportation**: 28%
- **Industry**: 20%
- **Commercial and Residential**: 11%
- **Agriculture**: 8%

Source: http://www.epa.gov/climatechange/ghgemissions/sources.html
Average Energy Consumption for US University Buildings

Energy used at tufts

- Electricity
- #6 Oil
- #2 Oil (home heating oil)
- Natural Gas
- Propane (Grafton)
- Purchased Steam (Boston)
Medford/Somerville heating systems
Medford/Somerville campus: energy systems

• **Heating**
  – District steam plants
    • Central, Tilton, Jackson, Cousens
  – Stand alone boiler plants
    Michael Pearson, 4 Colby Street, 80 George Street, other smaller facilities

• **Cooling**
  – Chiller systems
    Tisch, 4 Colby Street, Granoff
  – Package units and split systems
  – Window units

• **Purchased electricity**
Categories of Emissions Released by Fuel Used 2012 (short tons of CO2)

- Gas
- Gasoline commuting
- Gasoline on campus
- #6 Oil
- #2 Oil
- Propane
- Purchased Steam
- Electricity

Electricity is the largest category, followed by Gas.
Green Buildings

**LEED Certification**

- Sophia Gordon Hall, Gold
- School of Dental Medicine, Vertical Expansion, Silver
- School of Dental Medicine, Level 2 Renovation, Gold
- School of Medicine, Sackler, Certified
- Biology Labs at 200 Boston Avenue, Gold
Heating & Cooling Controls

• Manual control valves  
  (heating only)

• Thermostats

• Energy Management System
Lighting Controls

- Light switch
- Occupancy sensors
- Energy Management System
Electricity Reduction

Occupancy sensors are common
- Classrooms, conf. rooms, offices, washrooms, library stacks, some corridors, some labs

Energy Management System
- Site lighting
- HVAC controls tied to occupancy sensor
- Lab ventilation controls

Daylight sensing/dimming, lighting & controls

Ongoing technology updates include LED lighting
- 1,500 LED lamps provided at no cost by MA utility programs for all three campuses
- A19 LEDs provided to all Incoming students
Projects

• High efficiency condensing boilers: 4 Colby Street, Sophia Gordon Hall, 80 George Street, 58 Winthrop Street, 51 Winthrop Street

• Specific Building Projects
  – Science and Technology Center retro-commissioning
  – Pearson Chemistry heat recovery
  – The Fletcher School chiller replacement

• Fuel switching
  – Central Heating Plant -- #6 oil to gas
  – Tilton Plant -- #6 oil to gas

• Boiler Control Upgrades
  – Central Heating Plant

• Comprehensive lighting retrofits and controls
  – High bay lighting in gymnasiums and machine shops
  – LED lights in Art Gallery
  – LED lights in general use: Brown & Brew, Carmichael, 520 Boston Ave, Tisch Athletics
  – LED lamps to each residential student

• Steam trap replacement program
• Vending Misers
• Front load washing machines
• Dowling Hall electric vehicle charger
• Dowling Hall Solar: 99 kW of photovoltaics to be built if it ever stops snowing!
A solar array is coming to Dowling!
Cogeneration at Central Heating Plant

Waste heat from on-site electrical generation used to for campus heating needs
Substantial cost savings and greenhouse gas reductions are possible
Moving from feasibility study to concept design

Campus chilled water plant/system

To support new High Performance Science and Engineering Center (in design)
Would replace aging chiller plants and less efficient air conditioning over the next twenty years and beyond
Moving from feasibility study to concept design

Campus wide metering system

RFP almost complete
TEAM working group on Energy and Campus Sustainability reviewing software systems

Continued building efficiency efforts

Medford/Somerville utility master plan is studying:
Expectations – what you can do in your office

- Turn off computer at night
- Enable power management
- Buy a flat screen or laptop
- Turn off your lights
- Shut your fume hood sash
- Turn up/down thermostat (if available)
- Space heaters only if provided by Facilities because building heat is not available
Common Misconceptions

- Heating/cooling systems go on with the “flip of a switch”.
- Chilly in the summertime means the most wasted energy.
- The campus energy management system controls everything – my thermostat does nothing.
- It doesn’t matter if I open the window.
- It doesn’t matter if I use a space heater.
- It is better to call someone in Facilities and skip the Work Control system
How to Help

Report to Facilities Work Control:

– Leaks, stuck windows etc.
– Occupancy sensors that need adjustment
– Extreme indoor temperatures
– Be patient, but persistent

Reporting is particularly important in areas where there is no “owner”
Submitting a Service Request

Facilities Services - Online Service Request System

You are here to report routine repair, non-urgent maintenance service requests. Service requests will be processed during normal business hours.

If this request is an emergency during business hours, please contact your Facilities Services Department:

**Boston:** (617) 636-3535 - 8:00 am to 5:00 pm  
**Grafton:** (508) 839-7291 - 7:00 am to 5:00 pm  
**Medford:** (617) 627-3495 - 7:30 am to 5:00 pm

If this request is an emergency during off business hours, please call your University Police:

**Boston:** (617) 636-6610  
**Grafton:** (508) 887-4900  
**Medford:** (617) 627-3030

The University Standards for Web Browsers are I.E., FireFox and Safari. **IE 11 is not currently supported.**

Please enter your Tufts UTLN and password.*

UTLN: [blank]  
Password: [blank]

Submit

*If you have made your Tufts online directory information private your information will not be pre-populated in the work request form, nor will it ever be saved. You will also not be able to look up any of your previous requests.*
Questions?

Betsy Isenstein
elizabeth.isenstein@tufts.edu
617.627.3704
Purchasing
Between 2009 and 2010, the number of “green” products increased 73%.
What can you do in your office?

• Reduce and reuse first
• When you buy, buy sustainable
  - “Buy green, buy fair, buy local, buy used, and most importantly, buy less.” – Story of Stuff
• Talk with co-workers, purchasing staff, and suppliers
Helpful Resources

Tufts Purchasing Department:
http://finance.tufts.edu/purchasing/

Purchasing Guides:
http://www.responsiblepurchasing.org/purchasing_guides/all/
http://www.epa.gov/epp/
http://www.greenpages.org/

Eco-Labeling:
http://www.greenerchoices.org/eco-labels/
http://epa.gov/greenerproducts/consumer/index.html
http://www.nrdc.org/living/labels/cleaning.asp

Food Labeling:
http://archive.audubonmagazine.org/audubonliving/audubonliving1103.html

Green Printing at Tufts:
http://sustainability.tufts.edu/?pid=109&c=48
Some final thoughts

- Share the results of the Green Office Survey with a supervisor
- Provide resources to your colleagues
- Start an office (or building, or floor) green team
- Get to know your fellow Eco-Ambassadors
- Don’t forget OOS!
What does an Eco-Ambassador do?

1. Act as a point of contact and resource

2. Model sustainable behaviors

3. Implement office sustainability initiatives and foster behavior change
Social Marketing Plan

Step 1: Select Behaviors

Step 2: Identify Barriers and Benefits

Step 3: Develop Strategies

Step 4: Pilot

Step 5: Broad scale implementation & Evaluation
Looking ahead

Assignments:

• Create draft social marketing plan
  - Due March 21

• Meet with supervisor or existing Eco-Ambassador team
Thanks for participating!

Tufts gets green

http://sustainability.tufts.edu