



# Solid Waste Roadmap

## Key Issues

Council Work Session  
July 12, 2011



Metro | *Making a great place*

# Today's Presentation

10 min. Introduction and context  
(Paul Slyman)

40 min. Scenario planning progress report  
(Dan Pitzler, CH2M HILL)

20 min. Q&A and discussion  
(Paul Slyman)



# Purpose of the Solid Waste Roadmap

*Guide  
the  
solid  
waste  
system*

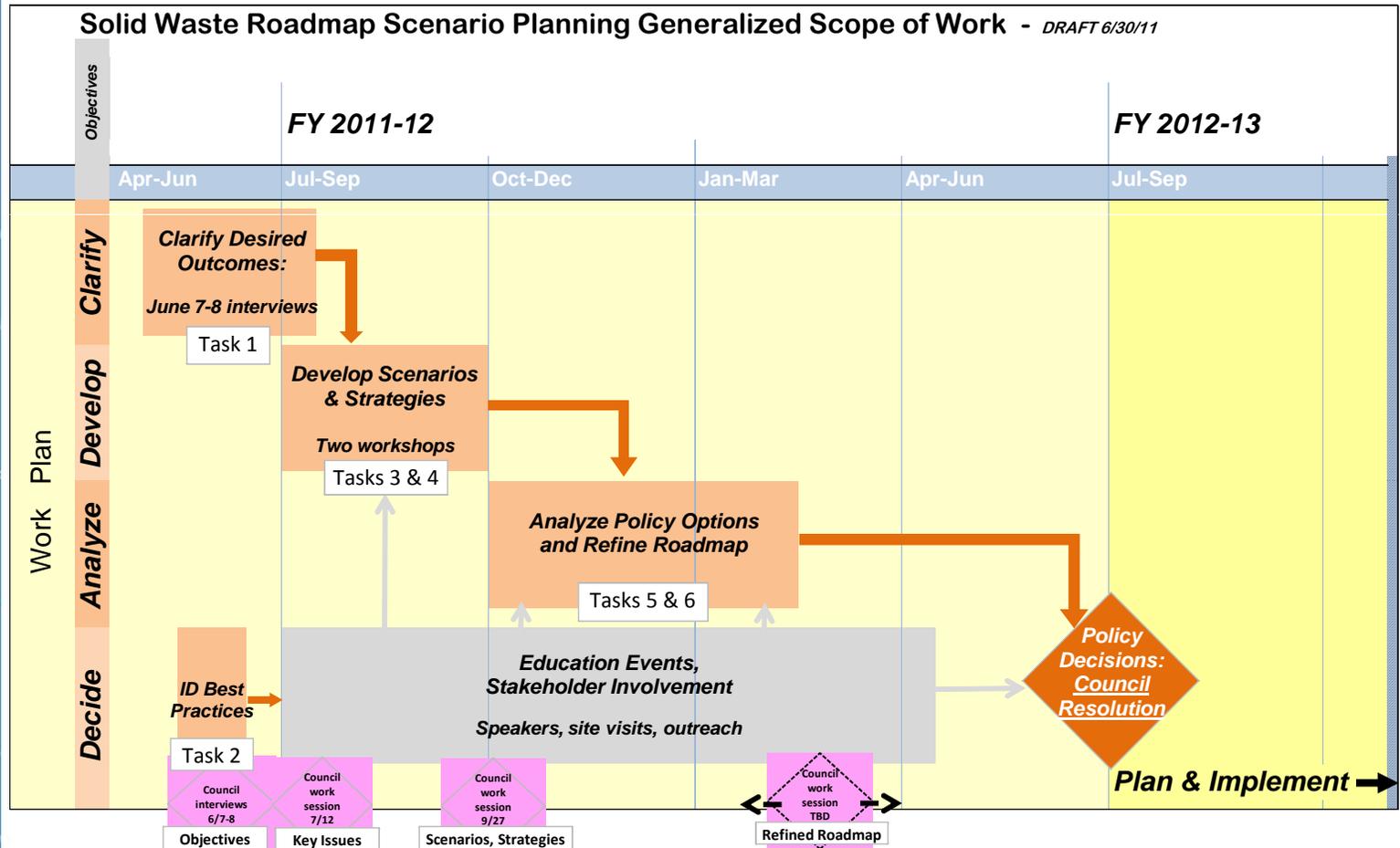


# Key System Drivers

- Technological, economic and social change
- Improved recycling
- Ample landfill capacity
- Expiring contracts



# The Process: Scenario Planning



# Stakeholders look to Metro for...

- Leadership
- Policy guidance
- Regulation





# Metro's Service Role

*Metro injects competition into the transfer system*



# Today's Goals



- ✓ Reaffirm objectives and assumptions
- ✓ Share key issues
- ✓ Provide best-practice examples



Solid Waste Roadmap  
Objectives, Key Issues, Best Practices, and Future Policy  
Considerations

**Metro Council Work Session, July 12, 2011**

## Contents

Roadmap purpose

Stakeholder interview summary

Roadmap objectives and key assumptions

Key issues, best practice examples, and future policy considerations

## Roadmap Purpose

*“Develop a plan for shepherding the Metro region solid waste system toward a future that better achieves the Metro Council’s desired outcomes, and provides a framework to facilitate collaboration and coordinate solid waste projects over the coming decade.”*



## Stakeholder Interview Summary

- Held June 7-8, 2011
- Councilors, staff, local governments, industry
- Over 30 individuals, 10 small groups
- Hundreds of years of experience
- Purpose
  - Desired features and objectives of regional system
  - Key issues and challenges
  - External trends



## Roadmap Objective 1: Vibrant Communities

**1. Vibrant communities** - *People live, work and play in vibrant communities where their everyday needs are easily accessible*

- Encourage innovation in waste prevention and recycling
- Ensure adequate oversight to prevent negative impacts from solid waste facilities



## Roadmap Objective 2: Economic Prosperity

**2. Economic Prosperity** - *Current and future residents benefit from the region's sustained economic competitiveness and prosperity*

- Economic development by using green energy to attract new businesses
- Encourage new, emerging recycling businesses
- Encourage using materials locally
- Ensure reasonable and affordable rates for users



## Roadmap Objective 3: Safe, Reliable Transportation

**3. Safe, reliable transportation -**  
*People have safe and reliable transportation choices that enhance their quality of life*

- Minimize trucking through the Columbia River Gorge
- Minimize wear on roads
- Minimize traffic congestion in the vicinity of facilities



## Roadmap Objective 4: Leadership in Climate Change

### 4. Leadership in Climate Change-

*The region is a leader in minimizing contributions to global warming.*

- Minimize diesel fuel use
- Minimize energy inputs and contributions to climate change
- Minimize greenhouse emissions by preventing waste



## Roadmap Objective 5: Clean Air and Water

**5. Clean air and water** - *Current and future generations enjoy clean air, clean water and healthy ecosystems*

- Minimize air pollution (local pollutants)
- Minimize water pollution
- Minimize toxicity of materials in waste stream



## Roadmap Objective 6: Equity

**6. Equity** - *The benefits and burdens of growth and change are distributed equitably*

- Distribute total societal cost equitably to all rate payers
- Ensure that the solid waste system does not disproportionately impact minority and low-income communities
- Ensure regional equity in the distribution of self-haul disposal opportunities
- Ensure that system is funded by those who use it



## Roadmap Key Assumptions

- Metro will retain the hybrid system of material transfer stations
- Metro's authorities provide it with ownership and regulatory authority over post-consumer materials generated in the region
- Revenues from the solid waste system are an important source of funding for planning and Metro's general government activities

## Key Issues

1. Zero waste and least cost planning
2. Organics regulatory framework
3. Organics processing facilities and technologies
4. Metro South
5. Self-haul policy and recycling options
6. Thermal conversion – emerging technologies and traditional waste-to-energy
7. System financing issues
8. Compressed natural gas for collection vehicles

## Key Issue #1 – Zero Waste and Least Cost Planning Stakeholder Comments

- *Some advocate establishing a zero waste policy goal for the region*
- *The quantity of waste to landfill is a poor proxy for environmental performance*
- *To truly evaluate the impacts of policy choices, Metro would need to include externalities in decision making*



Source: Women's Global Council on Sustainability



Source: CalRecycle

## Zero Waste Definition<sup>1</sup>

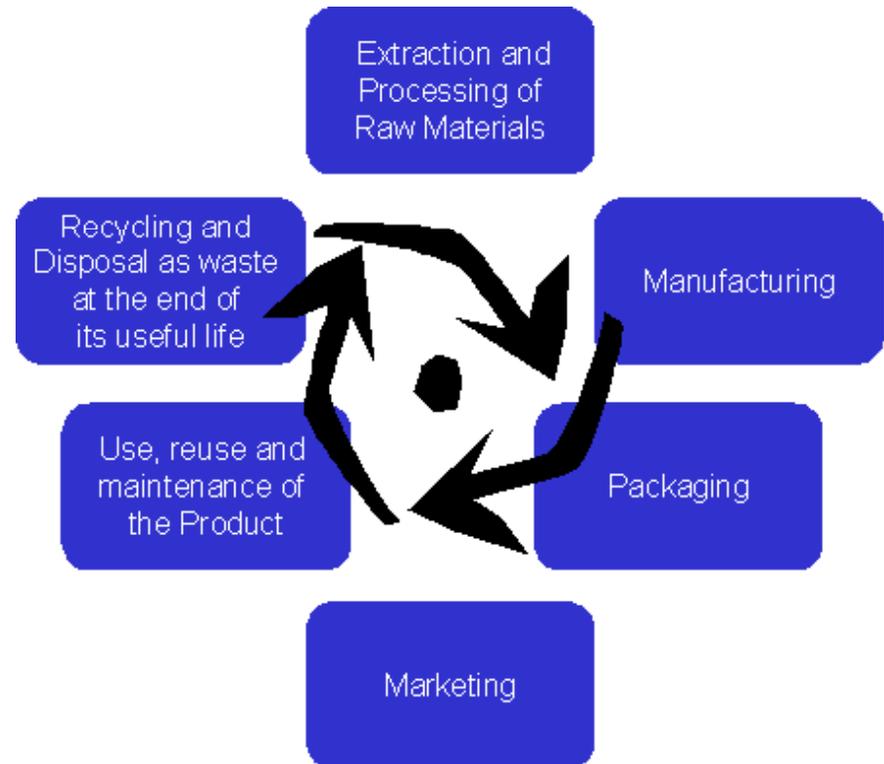
- “A goal that guides people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use
- Designing and managing products and processes to avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them
- Eliminating all discharges to land, water or air that are a threat to planetary, human, animal or plant health”



<sup>1</sup>Zero Waste International Alliance, 2004. (abbreviated).

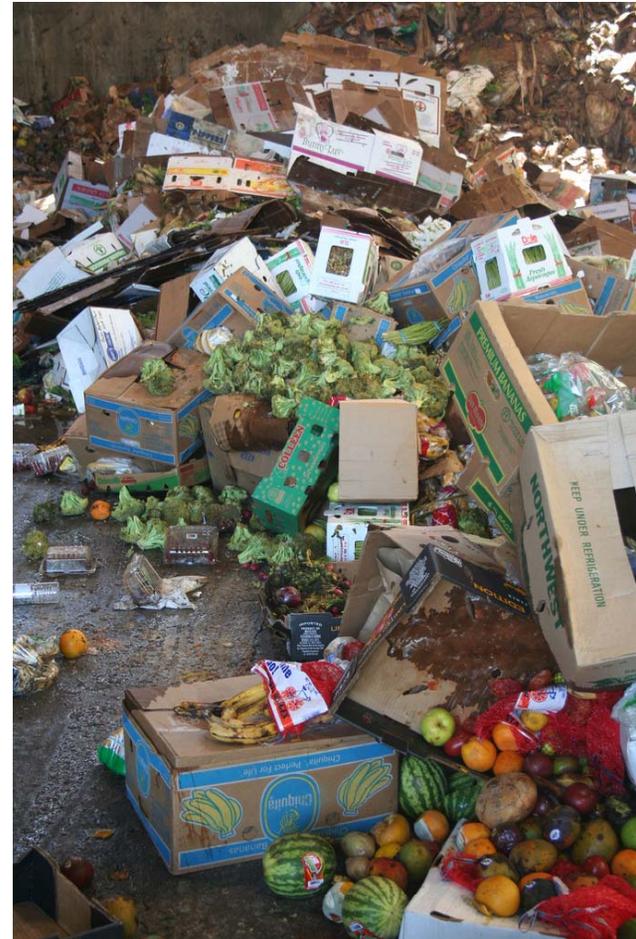
## Key Issue #1 – Zero Waste and Least Cost Planning Best Practices and Future Policy Considerations

- Most zw advocates believe that:
  - Recycling is a stop gap measure (crushing glass vs. refilling bottle)
  - Thermal facilities are inconsistent with zero waste
- Least cost planning (with life cycle assessment) would identify environmental and social cost of policy actions
- Future policy considerations
  - Should Metro adopt a zero waste policy?
  - Should Metro use least cost planning to guide decision making?



## Key Issue #2 – Organics Regulatory Framework Stakeholder Comments

- *Metro should determine how best to drive recovery of organics*
- *Combined yard/food waste facilities are being developed, but requirements are not consistent*
- *The system would benefit from consistency among jurisdictions in the region about what is compostable and what is recyclable (e.g., recyclable cutlery, bioplastics)*
- *The fragmented nature of the region's collection system makes it more difficult to coordinate organics diversion programs*



## Key Issue #2 –Organics Regulatory Framework Best Practices and Policy Questions

- Food diversion options:
  - Food waste prevention policies
  - Advocate for improved food labeling (FDA)
  - Metro funding to support local collection programs
  - Disposal ban
  - Mandate separate food collection in residential and food preparation sectors, or all properties (San Francisco)
  - Food donation infrastructure
- Policy Questions:
  - What should be the operating standards for combined food/yard waste facilities?
  - Pending RFP: What is the relative benefit from energy from AD vs. its relative cost?



## Key Issue #3 – Organics Processing Technologies Stakeholder Comments

- *Region needs more local options for processing and transferring organics*
- *Consider small-scale locally-distributed options*
- *For food, consider using anaerobic digestion (AD) to create energy rather than just composting*



## Key Issues #3 – Example Organics Processing Facilities



Dry AD, Rendsburg, Germany



Composting, Cedar Grove, Everett, WA.



Wet AD, East Bay MUD., CA.



Composting, Recology, Jepson Prairie, CA.

## Key Issue #3 – Organics Processing Technologies

### Anaerobic digestion

- Organic materials are broken down in the absence of oxygen and produce biogas (55% to 60% methane) and digestate that is generally composted
- Wet and dry technologies
- Estimated ~6 million ton/yr capacity in Europe (2010)
- A few facilities in North America, with a number under development



Incoming commercial organics



Hydropulper



Biofilter



Combined heat-power manifold

## Key Issue #3 – Organics Processing Technologies Best Practices and Future Policy Considerations

- Collection
  - Residential – food with yard or separate food
  - Non-residential – target high food producers initially
- Composting and Anaerobic digestion (AD)
  - Odor management is more difficult and costly than yard waste only
  - AD captures energy, then composting of digestate – added benefit and cost
- Future Policy Considerations
  - What is Metro's role in ensuring that food is collected separately from garbage at residential and non-residential properties in the region?



Gicon AD Plant, Biogasy, France



Dufferin AD Plant, Toronto, ON.

## Key Issue #4 – Metro South Stakeholder Comments

- *Metro South is located in the middle of a regional center; eventually a transfer station will not be highest and best use of that site*
- *The roadmap needs to define if the station should stay, go, or be reconfigured*
- *Metro should consider developing another self-haul facility nearby*
- *What type of replacement facility could be developed in the area (e.g., part of a lifestyle center)*
- *Metro should look for opportunities to help co-locating businesses with material management synergy*



**Metro South**

## Key Issue #4 – Metro South Best Practices and Future Policy Considerations

- Station no longer has capacity to meet Metro's objectives
- New transfer station issues
  - Other synergistic activities
  - Self-haul cost driver
  - Organics transfer
  - Materials recovery
- Future Policy Considerations
  - Should Metro South be closed and replaced at another location nearby?
  - Should Metro build a new station with self-haul capability in the vicinity?
  - Could self-haul be accommodated at an existing solid waste facility in the vicinity?



LEED Gold TS, Waste Management, Elgin IL.



Seattle So. RTS - \$40m, similar size to Metro South

## Key Issue #5 – Self-haul Policy and Recycling Options

### Self-Haul at Metro South

- Self-haul service is valued highly by residences and small business owners
- 70% of trips = 25% of tons
- Average load 600-800 pounds
- 130,000 trips per year
- Lead to significant queues
- Cash transactions, slower unloading, and large space requirements = high cost service
- Highly recyclable, but expensive to recover



Bulky waste pickup, Washington, D.C.

## Key Issue #5 – Self-haul Policy and Recycling Options Best Practices and Future Policy Considerations

- Mechanized self-haul recovery
  - Metro Central and Metro South
  - Monterey Regional Waste Management District (RWMD) – 130,000 tpy, 64% recovery
- Future policy considerations
  - Should additional self-haul be provided at some other location(s)?
  - Should Metro promote collection alternatives, and if so, which ones?



Pier 96 (Recology), San Francisco, CA.



Monterey RWMD, CA.

## Key Issue #6 – Thermal Conversion: Emerging Technologies and Traditional Waste-to-Energy – Stakeholder Comments

- *Oregon City and St. Helens have restrictions on waste combustion; others do not*
- *Mass burn waste-to-energy (WTE) facilities are expensive and have risks requiring mitigation*
- *There are industrial developments in the region that would benefit from district heat provided by a waste-to-energy facility*
- *Covanta in Marion County might be interested in an expansion to their existing waste-to-energy facility*



Fernwärme Wein WTE, Vienna, Austria



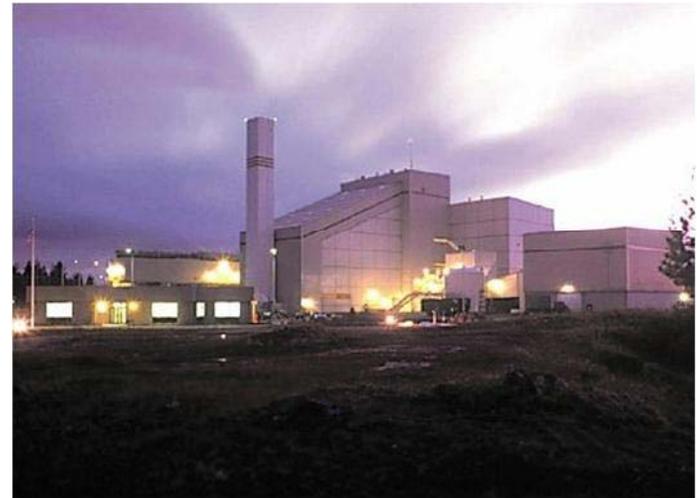
Marion County, OR. WTE Facility

## Key Issue #6 – Thermal Conversion: Emerging Technologies and Mass-Burn Waste-to-Energy – Stakeholder Comments (continued)

- Definition: Converting the carbon-based portion of the municipal solid waste (MSW) stream into useful products, such as electricity, ethanol, chemicals, aggregates, or fertilizers using heat, pressure, biological and/or chemical processes
- Plastic to oil facilities are an emerging technology
- If Metro considers pursuing a thermal facility, it should lay the groundwork for public acceptance
- The region should be careful to not commit to facilities with high tonnage requirement



Agilyx Plastic to Oil, Tigard, OR.



Mass-burn WTE, Spokane, WA.

## Key Issue #6 – Thermal Conversion: Overview

- Mass-burn and refuse-derived-fuel (RDF) plants
  - 88 plants in U.S.; hundreds world wide
  - Some expansions in U.S. under way
- Emerging conversion technologies
  - Gasification, pyrolysis, plasma arc gasification
  - 40+ at 100 tpd that use municipal solid waste (MSW) as main feedstock
  - No commercial scale plants using MSW in operation in North America
  - Many in pilot stage, under construction, or planning



Mass-burn WTE, Burnaby, B.C.



IES Pyrolysis Plant, Romoland, CA.

## Key Issue #6 – Example European Waste-to-Energy Facilities



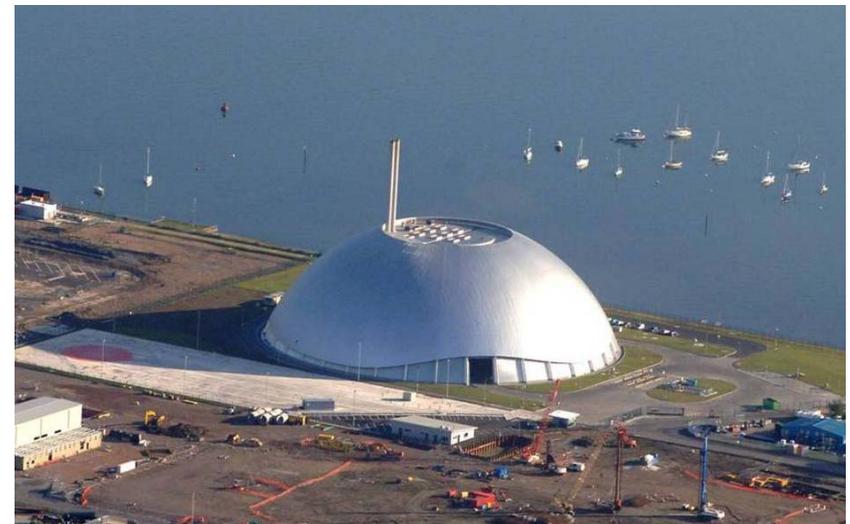
AVR, Rotterdam, Netherlands



Lille, France



Brescia, Italy



Portsmouth, UK.

## Key Issue #6 – Thermal Conversion Technologies – Advantages and Disadvantages

- Advantages
  - Residuals to landfill are 1-25% of incoming MSW
  - Produces usable products from residual MSW like electricity, synthetic fuels, carbonized char, chemicals
  - Potential for district heat and broader industrial development
  - Lessen long-term environmental liability of landfills
  - Emerging technologies result in lower air emissions and potential for fewer greenhouse gas emissions vs. landfill
  - Emerging technologies can be smaller and target various waste streams (e.g., plastics to oil)
- Disadvantages
  - Mass-burn facilities capital intensive (\$300-\$700 million) requiring “put or pay” agreements
  - Low energy rates and not qualifying for renewable portfolio credits hurt economics
  - Closed loop reuse and recycling environmentally preferred
  - Emerging technologies promising but no operating history in North America
  - Generally more expensive than landfill
  - Segment of the public is strenuously opposed to thermal facilities (e.g., California experience)

## Key Issue #6 – Other Conversion Technology Considerations

- Dizzying array of processing methods and combinations producing different end-products
- Key drivers: EU landfill directive, local handling requirements, feed-in tariffs
- Autoclave
- Mechanical-biological treatment (MBT)



C3 Autoclave, Limerick, Ireland



Arrow-Bio MBT, Sydney Australia

## Key Issue #6 – Thermal Conversion: Emerging Technologies and Traditional Waste-to-Energy – Future Policy Considerations

- Future Policy Considerations
  - Should Metro pursue thermal conversion for all or part of its waste?
  - How “proven” must a conversion technology be for Metro to consider it?



Plasco Plasma Arc, Ottawa, ON.



Ebara Gasification, kawaguchi, Japan

## Key Issue #7 - System Financing Issues

### Stakeholder Comments

- *As less waste is disposed, Metro's per-ton excise tax will continue to increase*
- *Consider broadening Metro's tax base to include all materials that arrive at a processing facility (recycling, recovery, composting) or disposal facility*



## Key Issue #7 - System Financing Issues

### Best Practices and Future Policy Considerations

- Many options to broaden the revenue base
  - Many jurisdictions charge mandatory fees for recycling and note it on utility bills
  - Tompkins County, NY. changed to annual fee per household
  - Franchise fee on recyclables in San Jose (\$0 at this time)
  - In 2010, Berkeley proposed a fee on curbside recycling
- Future Policy Considerations
  - Should Metro broaden its fee base?
  - Should Metro charge a fee on recyclables, organics, and other currently exempt materials?

## Key Issue # 8 – Compressed Natural Gas (CNG) for Collection Vehicles – Stakeholder Comments

- *Many stakeholders expressed support for a regional requirement that all material collection trucks use compressed natural gas*
- *Metro should consider taking a role in facilitating fueling centers across the region*
- *Haulers like the higher certainty of fuel prices, and the quieter vehicles that result in fewer customer complaints*



CNG Station, Fort Myers Beach, FL.



CNG Station, Camden, NJ.

## Key Issue #8 – Compressed Natural Gas (CNG) for Collection Vehicles – Best Practices and Future Policy Considerations

- Estimated about 4,000 collection vehicles running on CNG today
- South Coast Air Quality Management District (SCAQMD) rules drove change and now 90% of collection vehicles in CA. run on natural gas
- Future Policy Considerations
  - Should Metro take action to help establish a network of alternative fuel centers across the region?
  - Should Metro establish a policy requiring all collection vehicles to operate using CNG?



# Questions

- Objectives and assumptions affirmed?
- Visits, speakers or issues to learn more about?
- Topics for SWAC?

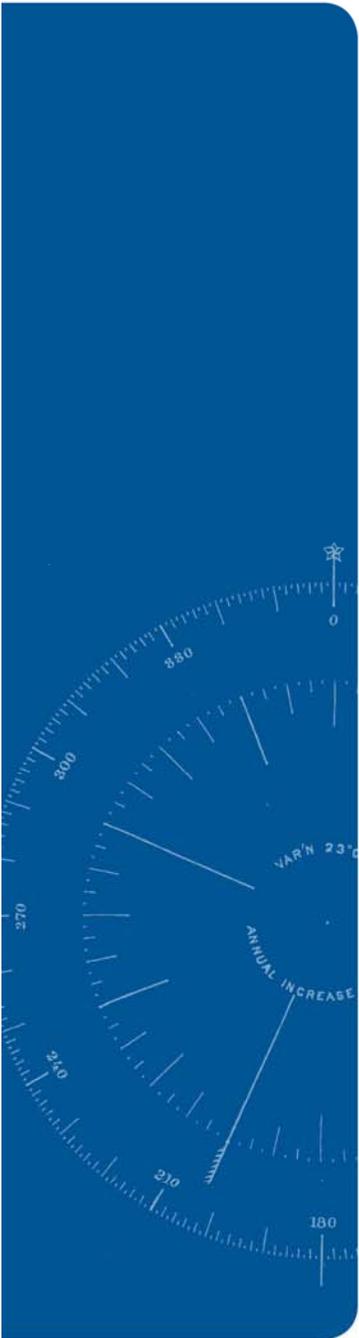


# Objectives



# Assumptions

- Hybrid transfer system
- Metro authority over waste
- Solid waste continues as a General Fund revenue source

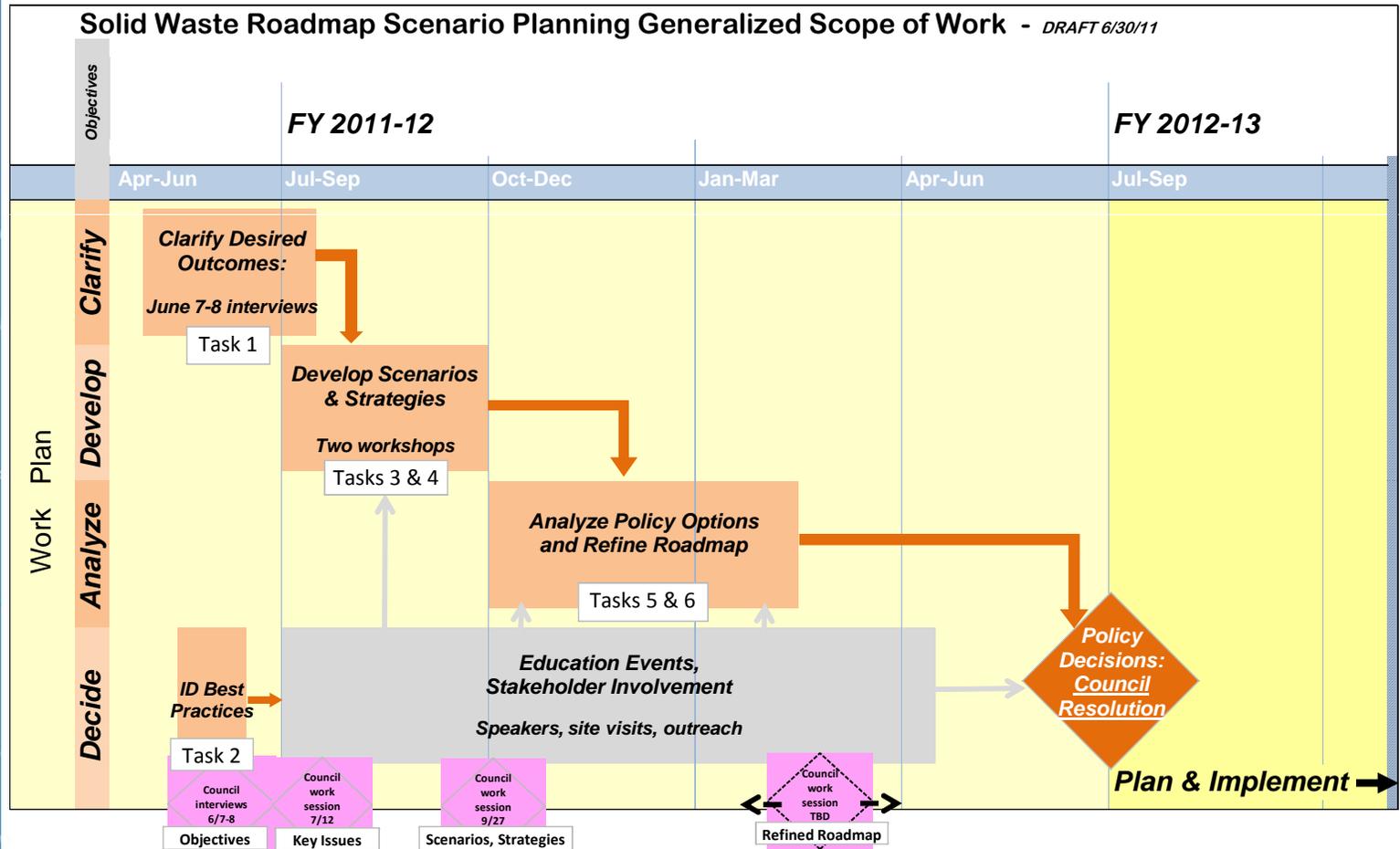


# Questions

- Objectives and assumptions affirmed?
- Visits, speakers or issues to learn more about?
- Topics for SWAC?



# The Process: Scenario Planning



# Next Steps

- Scenario and strategy development (August)
- More stakeholder involvement (September)
- Council work session (September)
- Analyze strategic options (Fall)
- Refine roadmap (2012)

