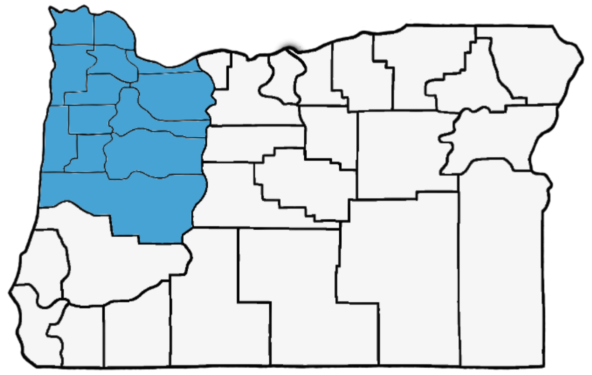

2025 SMMP TASK FORCE

Regional Waste Subcommittee Meeting #1

Thursday, February 20, 2025

RRS

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Regional Waste Subcommittee

Note: Recording is ON for notetaking purposes.

AGENDA

2:45 pm	Welcome & Housekeeping
2:50 pm	Review of Current State/Examples Presentation
3:00 pm	Presentation of New Case Studies/Examples
3:25 pm	Guiding Questions for each Focus Area
3:40 pm	Finalize Focus Areas
4:00 pm	Future State Discussion and Questions
4:20 pm	Benefits and Consequences Overview
4:40 pm	Next Steps and Action Items
4:45 pm	Adjourn

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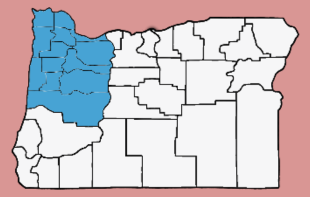

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GROUP AGREEMENTS

- **Prioritize Relationships:** put people before process
- **Acknowledge and Share Power:** Step up, step back
- **Value Many Perspectives:** Elevate lived and work experience
- **Communicate Directly:** Use plain language, ask for what you need
- **Create Shared Understanding:** share historical context, contextualize decisions
- **Exercise Curiosity:** Be willing to listen, learn, and reflect on feedback

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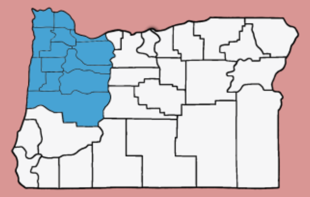

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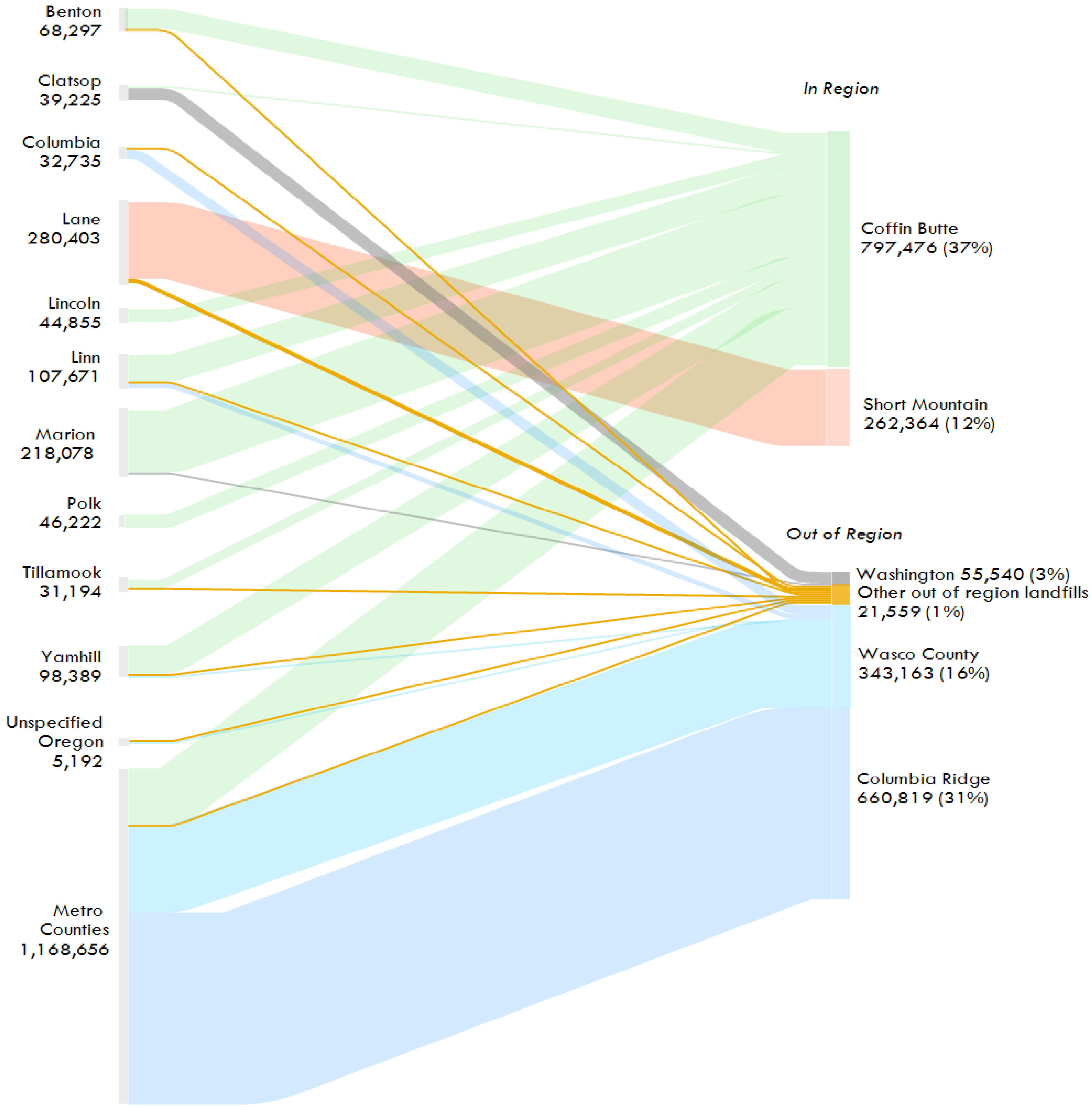
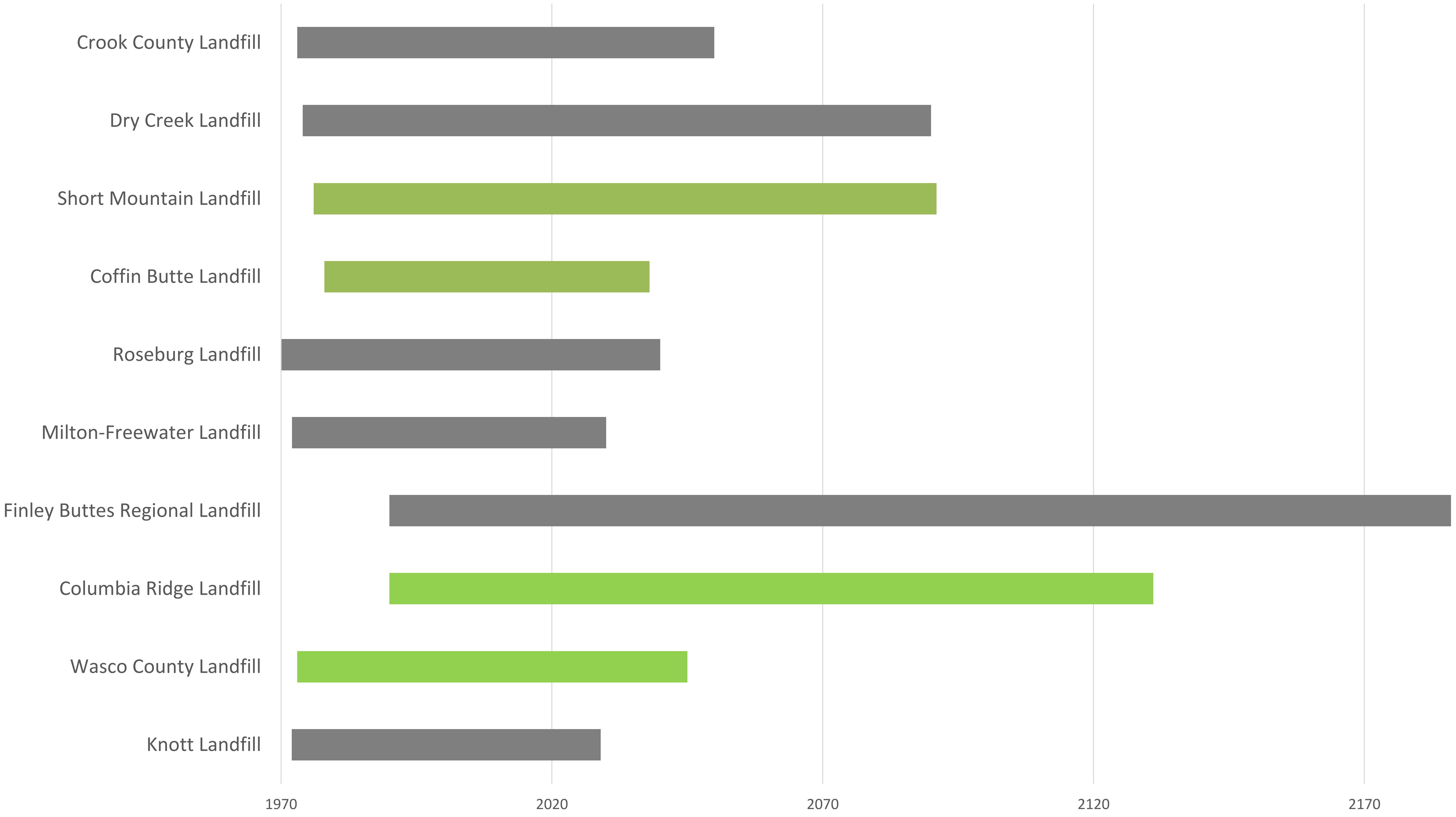
RESEARCH RECAP: WASTE FLOWS IN NW OR

- **48%** of regional waste transported out of region.
- **37%** of regional waste including Metro, delivered to Coffin Butte.



LANDFILL LIFESPANS



IN-REGION LANDFILLS

Landfill Name	City	County	RT Distance (from SLM)	Ownership Type	Owner	Year Opened	Closure Year	LFG Collection System?
Coffin Butte LF	Corvallis	Benton	50 miles	Private	Republic Services, Inc.	**1978**	**2038**	Yes
Short Mountain LF	Eugene	Lane	142 miles	Public	Lane County, OR	**1976**	**2091**	Yes

OUT-OF-REGION LANDFILLS

Landfill Name	City	County	RT Distance (from SLM)	Ownership Type	Owner	Year Opened	Closure Year	LFG Collection System?
Knott Landfill	Bend	Deschutes	274 miles	Public	Deschutes County, OR	**1972**	**2029**	Yes
Wasco County Landfill	The Dalles	Wasco	268 miles	Private	Waste Connections, Inc.	**1973**	**2045**	Yes
Columbia Ridge LF	Arlington	Gilliam	372 miles	Private	WM	**1990**	**2131**	Yes
Finley Buttes Regional Landfill	Boardman	Morrow	446 miles	Private	Waste Connections, Inc.	**1990**	**2186**	Yes
Roseburg LF	Roseburg	Douglas	270 miles	Public	Douglas County, OR	**1930**	**2040**	Yes
Dry Creek Landfill	Eagle Point	Jackson	476 miles	Private	Rogue Disposal & Recycling	**1974**	**2090**	Yes
Crook County Landfill	Prineville	Crook	294 miles	Public	Crook County, OR	**1973**	**2050**	No
Chemult Landfill	Chemult	Klamath	~424 miles	Public	Klamath County, OR	**Unknown**	**Unknown**	Unknown

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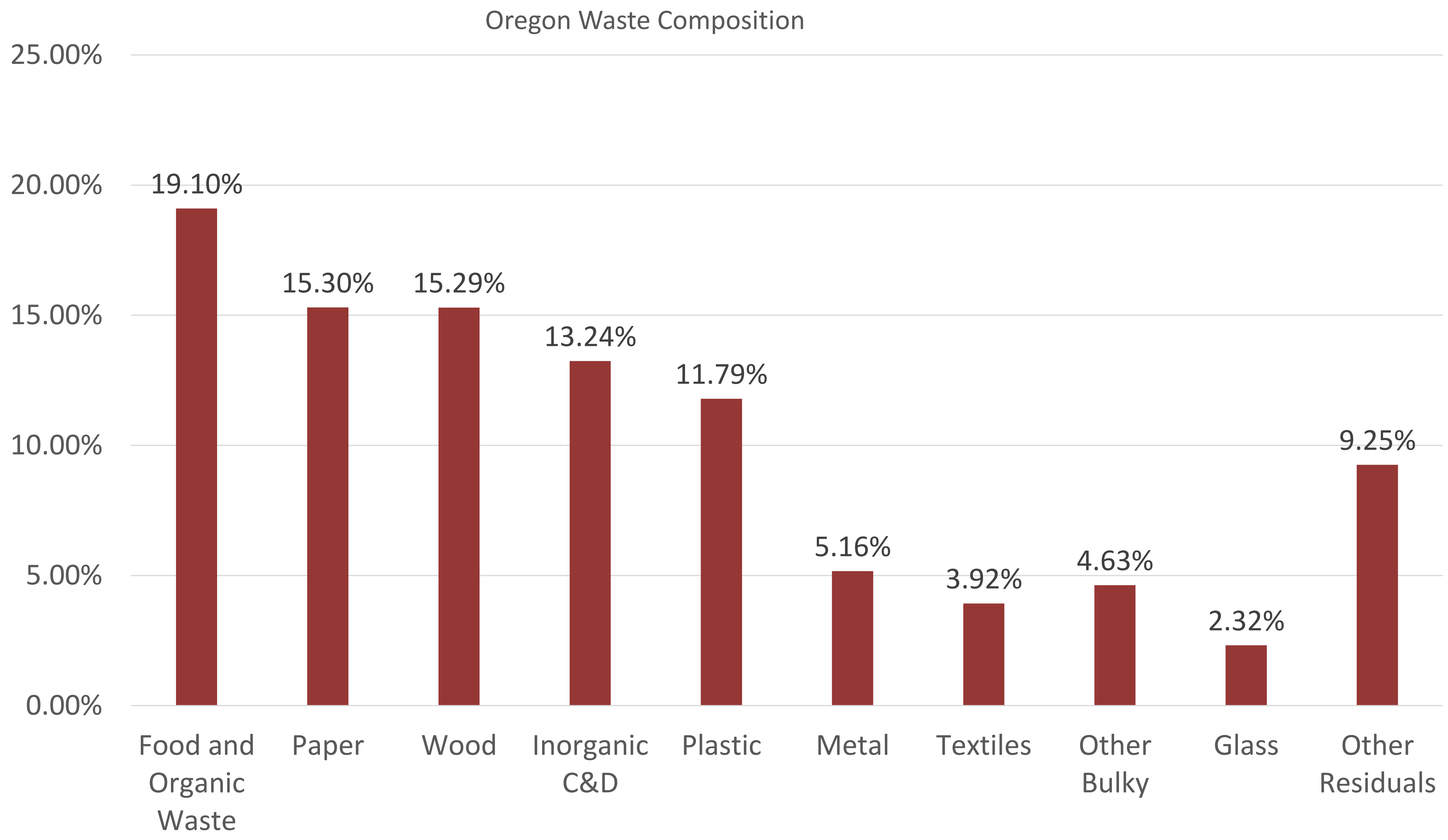
BREAKDOWN BY MATERIAL



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HISTORICAL MSW RECOVERY APPROACHES

- Waste to Energy
- Composting Mixed Waste
- Refuse Derived Fuel (RDF)
- Solid Recovered Fuel (SRF)
- Gasification
- Mixed Waste MRFs
- Integrated Mixed Waste Processing Facility

EARLY DAYS OF MIXED WASTE PROCESSING

1960s-1970s

- **Early Days of Waste Management and Recovery**
  - Incineration with minimum pollution control used to reduce waste volume and mass
  - Inefficient source-separated recycling programs

1980s

- **Emergence of Mixed Waste Processing**
  - Waste-to-Energy (WTE) facilities with advanced air pollution control technologies to manage entire MSW stream in areas with limited landfill capacity
  - Refuse-derived Fuel (RDF) facilities produce combustible fuel from organic fraction of MSW
  - Early composting technologies for processing source separated green waste and MSW
  - Early MRFs with manual and basic mechanical technologies for processing separated dual stream (paper / containers)

1990s

- **Technological Advancements and Diversification of Waste Treatment Approaches**
  - Advanced RDF produce higher quality fuel and potential to co-fire with coal. However, closure rates are high
  - Composting source separated organics more common. Mixed waste composting continues to struggle- large facilities fail
  - Mechanical Biological Treatment (MBT) combines front end sorting (recyclables) with biological treatment (composting or anaerobic digestion)
  - Single stream recycling with more mechanical sortation technologies and larger facilities. Automated cart tippers reduce operating costs for collection.

MODERN APPROACHES TO MIXED WASTE PROCESSING

2000s

- **Continued Advances and Integration of Thermal Treatment**
  - Single stream recycling takes off with more automation in sorting and trucks with larger carts increasing efficiencies
  - MBT facilities widely adopted in Europe to comply with landfill diversion targets and high tip fees.
  - Thermal treatment such as pyrolysis or gasification added to MBT process, however, economic and technical challenges in scaling up
  - Increased adoption of RDF in cement kilns, where it is co-fired with traditional fossil fuels. Other applications of RDF struggle.

2010s

- **Integration of Circular Economy Principles and Advanced Technologies**
  - Plastic replacing newsprint, office paper and glass. It is less dense and more costly to recover. Market disruptions and quality issues on recycled commodities emerge as a huge threat
  - MRFs respond with more sensor-based technologies like near-infrared (NIR) spectroscopy, robotic sorting, and artificial intelligence.

2020s

- **Digitization and Increased focus on Circularity**
  - Decline in recycling rates and landfill limits lead to focus on food waste, C&D and sortation of MSW.
  - AI and machine learning increasingly used to improve recovery rates at MRFS and emerge in the front end of MWP facilities.
  - Chemical recycling facilities address low plastic recycling and demand for post consumer resin (PCR)
  - AD and advanced composting techniques used together improve organic recovery and produce renewable energy
  - Biochar production emerges as opportunity for carbon sequestration and PFAS mitigation within a MWP system

BENEFITS & CONSEQUENCES FRAMEWORK PRIORITIZATION

Strategy	Diversion potential (amount and/or impact)	Economic benefits outweigh risks/costs	Environmental benefits outweigh risks/costs	Human health benefits outweigh risks/costs	Feasibility
Strategy A					
Strategy B					
Strategy C					
Strategy D					
Strategy E					

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FOCUS AREAS

- **Transfer Station Design for Recovery –** *Research Available: Medium-High*
- **Transfer Network/Logistics/Export –** *Research Available: Low to Medium*
- **Integrated Mixed Waste Facility –** *Research Available: High*
- **Biochar –** *Research Available: Low*
- **Refuse Derived Fuel –** *Research Available: Medium*
- **Pyrolysis / Gasification –** *Research Available: Medium*
- **Waste-to-Energy –** *Research Available: High*

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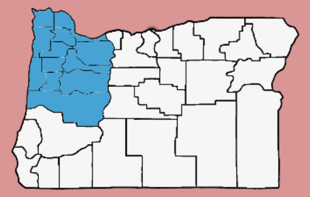
REGIONAL WASTE – FOCUS AREAS

Name	Description	Action Type	Diversion Considerations	Examples
Transfer Station Design for Recovery	Transfer stations are important way point for MSW within the system. Rather than looking at them simply as a place to aggregate and ship materials to the landfill there are opportunities to design these sites to maximize recovery and even co-locate end markets.	Public and/or private sector investment / partnership	Transfer stations have the potential to increase focus on recovery to serve as a screening point for capturing materials for recycling or reuse from routes or self-haul. The materials already flow through, so system changes aren't needed. Consider new-build or retrofit.	• Dane County, WI • Phoenix Resource Innovation Campus • Metro Regional Systems Facility Plan
Transfer Network/ Logistics/ Export	Transfer stations are part of a larger network of logistics that efficiently move MSW to end of life. A network redesign may be able to assign different functions to transfer stations of different sizes and geography.	Public / Private Sector coordination	Whether the destination is landfill or end market, transfer logistics and economies of scale are important to optimize efficiency, which can enable new opportunities than exist for an individual facility. Agreement among different owner/operators (public and private)	• Metro Regional System Facility Plan
Mixed Waste Recovery Facility	The facility uses combines advanced technologies in organic and inorganic recovery to capture materials directly from mixed municipal solid waste (MSW). These systems include a range of state-of-the-art technologies that may include a combination of screens, trommels, organic presses, AI enabled optical sorters, mechanical separators, anaerobic digestion, aerated static pile composting to recover recyclable materials directly from mixed municipal solid waste. This innovative approach enhances recycling rates and reduces landfill reliance in the region.	Public and/or private sector investment / partnership	Able to capture both organic and inorganic materials for maximum diversion potential on MSW. However, can be very capital intensive resulting in a very high cost per unit diversion. Quality of recovered materials is an important factor and assumptions should be investigated closely. There will still be remaining residue to consider.	• CleanLane Resource Recovery Facility • Project Juno • Athens Waste • Bioenergy Rialto
Biochar	This process can convert organic fraction of MSW and/or digestate from Anaerobic Digestion into biochar, which locks in GHG and toxins and may have potential productive end uses.	Public and/or private sector investment / partnership	Addresses the largest portion of the MSW stream (food waste). Could pair with anaerobic digestion. Potential for end-use in applications, such as water filtration and soil amendment, but market potential is more theoretical at this point.	• San Luis Obispo Biogas Plant • Application in wastewater filtration

REGIONAL WASTE – FOCUS AREAS

Name	Description	Action Type	Diversion Considerations	Examples
Refuse Derived Fuel (RDF)	RDF technology emerged in the 80's to produce a combustible fuel from mixed MSW. Mechanical processes shredded the waste and separated metals, glass, and non-combustible materials. The resulting RDF could then used in industrial boilers or power plants. Often used in the cement industry.	Public and/or private sector investment / partnership	Can be paired with Mixed Waste Processing or as a stand-alone process. Maximizes landfill diversion. Challenging permitting and environmental risk profile.	• Re-Power South • Xcel Energy
Pyrolysis / Gasification	Pyrolysis, gasification, and plasma arc technologies use thermal processes to produce synthetic gas (syngas) from MSW and reduce waste to inert slag. However, these technologies faced economic and technical challenges in scaling up and based on preliminary research are not presently operating as intended.	Public and/or private sector investment / partnership	These facilities are typically privately developed. They are very expensive, are energy intensive, and have had a history of closure due to financial stress and unmet recovery targets. There is also a need to landfill the resulting slag.	• Fulcrum Bioenergy • Enerkem
Waste-to-Energy -	Waste-to-Energy (WTE) facilities with advanced air pollution control technologies to manage entire MSW stream are used in areas with limited landfill capacity. ~60 plants operating In the US. mostly on the East Coast with leading capacity in Fl, NY and PA. Not common in West Coast. With ReWorld closure, none in Oregon, 1 in WA and 2 in CA.	Public and/or private sector investment / partnership	WtE in Marion County Recently closed. Would there be appetite for exploring a new site? What are the other environmental considerations and impact to local communities?	• Closure of ReWorld • Profile of WtE in the US



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FOCUS AREA CONSIDERATIONS

- What options should we consider?
- What are the known barriers that have stopped previous efforts to do this?
- In addition to the Benefits & Consequences Framework, are there other considerations unique to this focus area?
- A bit more specific: What are the known barriers that have stopped previous efforts to do this?

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REFINE FOCUS AREAS

- What Focus Areas resonate the most with the SMMP?
- What Focus Areas will have the highest benefit and impact on the region's waste system?
  - Amount of material
  - Impact of material
- What is the feasibility of this Focus Area?
  - Effort – How much capacity, resources, financial investment, policy development, and political leadership is needed to make this happen?
  - Time
    - What actions can be done in the next year?
    - What actions can be done in the 5 years?
    - What actions can be done in the next 25 years?
  - Actors – who needs to take the first or next step to make this happen?
- How much data and case studies are available on this Focus Area?
- What is the systemic readiness of this Focus Area?

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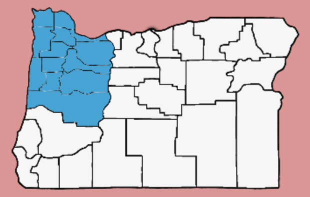

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FUTURE STATE DISCUSSION

- What are the desired outcomes?
- What does success look like in the region?
- How can success be tracked?
- How does this contribute to the Regional SMMP?

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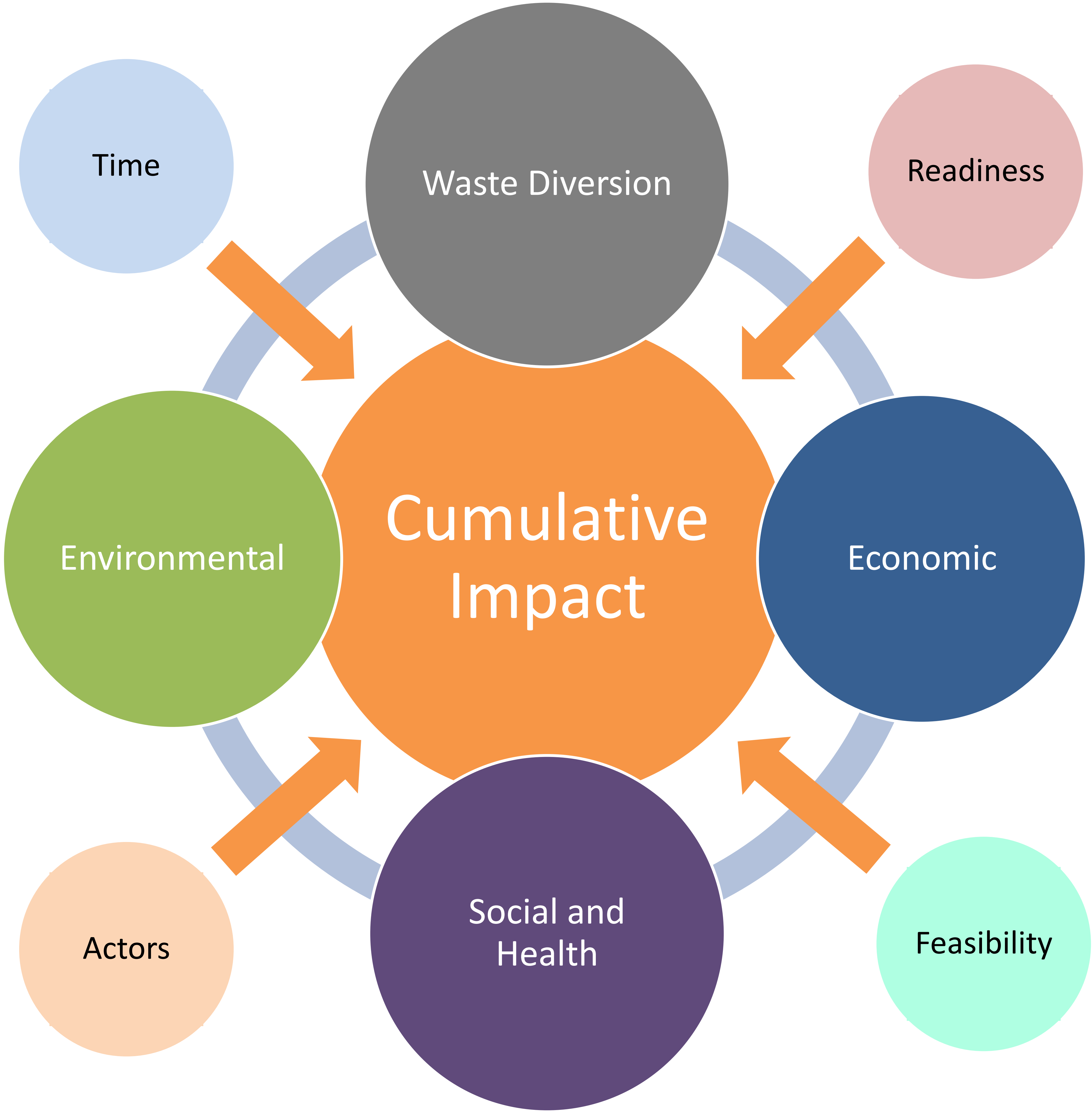
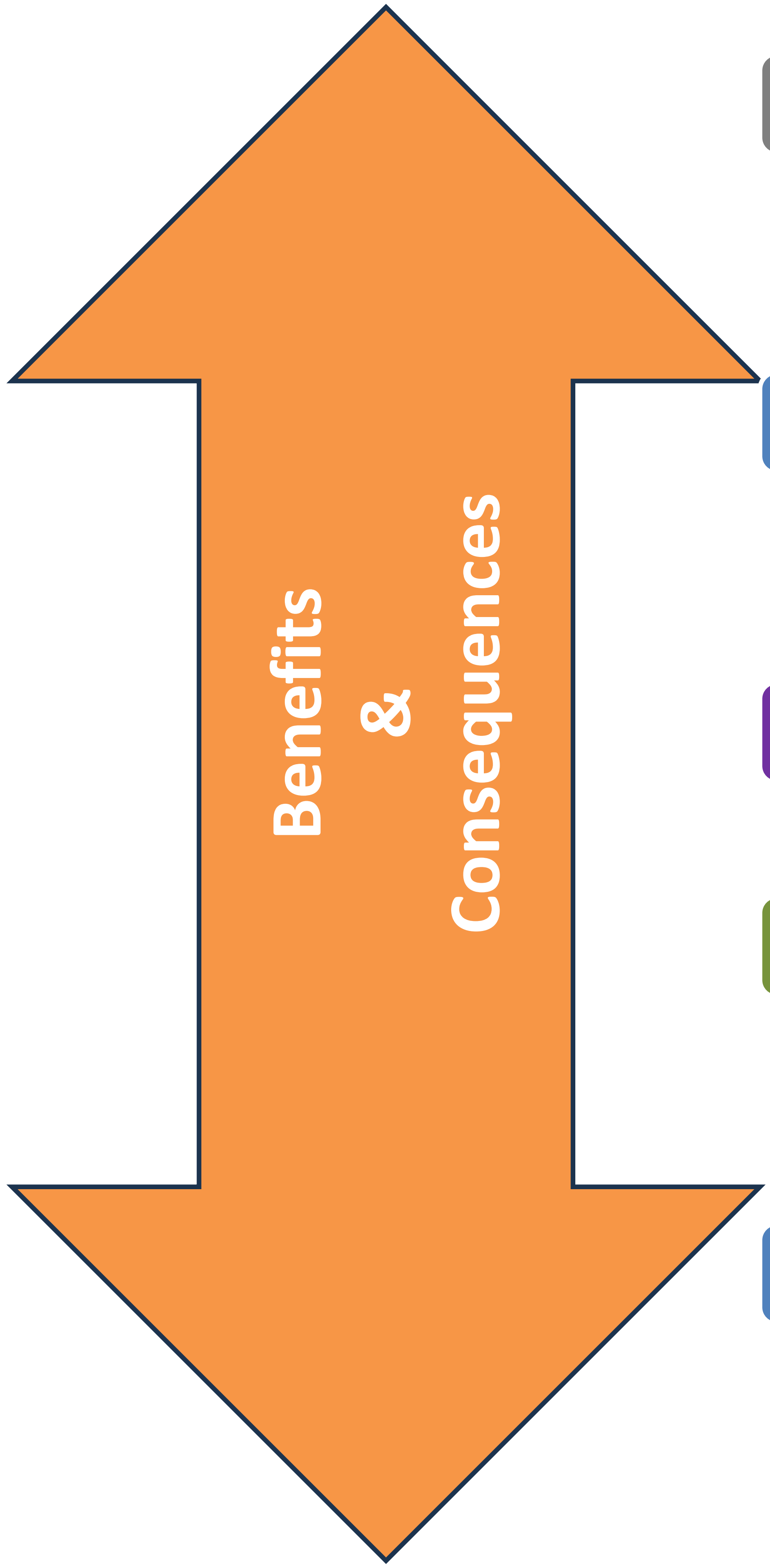
BENEFITS & CONSEQUENCES FRAMEWORK



BENEFITS & CONSEQUENCES FRAMEWORK



Waste Diversion

- What is the potential to divert waste from landfill?
- What is the potential to prevent waste generation?
- Are the materials diverted/prevented a strategic priority (i.e. they are a big proportion of the waste stream or pose greatest threats to environmental or human health)?

Economic Outcomes

- Do economic benefits (such as job creation, economic development, or reduction of risks or clean up costs outweigh the costs (such as capital costs, operational costs, and potential future risks)?
- Is there a potential to send long term market signals that would change business or consumer behavior (such as reducing packaging or increase reuse)?

Human and social health

- What risks are posed to human health, and how do those risks compare with alternatives?
- Will all communities and groups have access to the benefits? Will any communities experience unique burdens?

Environmental health

- What are the benefits or risks for air quality, water quality, soil health?
- What is the potential to reduce the demand for virgin materials (through recovery, reuse, and recycling?
- Are there benefits for critical or sensitive materials or habitats?
- What are the associated climate emissions (relative to alternatives)?

Feasibility

- What actions need to be taken but what groups or entities?
- How long will it take to take to see results?
- Can we reasonably expect to address/overcome known barriers?
- What are the known unknowns?

BENEFITS & CONSEQUENCES FRAMEWORK PRIORITIZATION

Strategy	Diversion potential (amount and/or impact)	Economic benefits outweigh risks/costs	Environmental benefits outweigh risks/costs	Human health benefits outweigh risks/costs	Feasibility
Strategy A					
Strategy B					
Strategy C					
Strategy D					
Strategy E					

Thank You!

Next Meeting:
Regional Waste
Subcommittee Meeting #2
Wednesday, March 5, 2025
8:00 am – 10:00 pm

RRS

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