

Strategic Plan for Reuse, Repair, and Extending the Lifespan of Products in Oregon

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Executive Summary

This Strategic Plan provides a framework to direct the Oregon Department of Environmental Quality's work over a six-year period specific to reuse, repair, and extending the lifespan of products. The overarching goal of this Strategic Plan is to extend the lifespan of products in Oregon in a manner consistent with Oregon's 2050 Vision for Materials Management. Drawing on a year-long evaluation of materials, infrastructure, economics, businesses and nongovernmental organizations, policies, challenges, and opportunities, four overarching strategies have been identified: foundational research, developing infrastructure and building capacity, driving demand to use that infrastructure, and policy support where needed. While a wide variety of materials present opportunities for reuse, repair or product lifespan extension, DEQ has identified three broad categories of products that are deserving of extra focus: building materials, textiles, and possibly products that are amenable to remanufacturing, pending the results of a separate national remanufacturing industry planning process currently underway.

Acknowledgments

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Many individuals within DEQ contributed to the development of this project, including major efforts from Stephanie Caldera (project manager), David Allaway (project team lead), Minal Mistry, and Lisa Heigh (Metro). Additional support was provided by Jill Inahara, Michele Martin, Jordan Palmeri and Simon Love. More information on the Reuse, Repair and Product Lifespan Extension project appears on the project website: <http://www.oregon.gov/deq/LQ/Pages/SW/productlifespan.aspx>.

Introduction

In 2012, the Oregon Environmental Quality Commission adopted Materials Management in Oregon: 2050 Vision and Framework for Action. This update to the state’s legally-required solid waste management plan signified a programmatic shift from managing disposal of materials to managing materials across their full life cycle.

Legislation in 2015 clarified DEQ’s authority to support this broader materials management perspective, and provided funding to implement highest priority actions consistent with the Framework for Action. One of several priority work areas for DEQ involves extending the lifespan of products, such as through reuse and repair. While obviously slowing the generation of wastes requiring recycling or disposal, the far larger environmental benefit of this approach involves reducing the profound environmental impacts associated with producing manufactured goods.

DEQ has developed this Strategic Plan for Reuse, Repair and Product Lifespan Extension to establish a six-year strategy for DEQ and others to pursue between 2016 and 2021. It is intended to identify innovative and strategic ways to apply state resources to achieve this goal: extend the lifespan of products in Oregon consistent with Oregon’s 2050 Vision for Materials Management.

The 2050 Vision and Framework for Action identifies the following guiding principles that focused the development of this plan and will guide future implementation.

- Develop and implement policies and programs based on robust research;
- Lead when appropriate;
- Coordinate and collaborate with partners;
- Ensure that actions complement one another;
- Build on what’s already working, such as using existing infrastructure when possible;
- Focus on high-impact materials and processes;
- Be flexible and adaptable;
- Continuously use the Framework for Action and update as necessary; and
- Consider environmental and other impacts of policy options, including: social equity, quality of life, economic viability and potential unintended consequences.

As the name implies, this Strategic Plan addresses reuse, repair and otherwise extending the lifespan of products, where appropriate. It does not address recycling, other transformation of goods through creative “upcycling,” or the “sharing economy” associated with neighborhood tool libraries or house and car-share industries. The salvage of edible food – sometimes considered a form of “reuse” – is also not within the scope of this plan. In addition, DEQ has chosen to not address motor vehicle-related reuse and repair in this project, as that sector operates well without additional government intervention.

The Strategic Plan will be reviewed periodically and updated as DEQ, and Oregon, moves toward the goals and objectives of the 2050 Vision.

Strategic Planning Process

Over the past year, DEQ staff explored the world of reuse, repair, and product lifespan extension to better understand the current and potential environmental and economic impacts of a range of materials and products. Additionally, this research identified some of the reuse and repair industries that are emerging, holding fast or growing their business; what has kept these businesses steady, solvent and moving forward; and what business models and materials may be most ripe for strategic investments.

After researching literature, seeking input from local stakeholders, and interviewing national subject matter experts, DEQ identified a list of over 120 options for possible action (See Chapter 8 of the project's Background Paper). These options were then reviewed against a series of criteria, including: environmental value, consistency with Oregon's 2050 Vision, potential for transformational rather than incremental change, best use of limited DEQ resources, alignment with DEQ core competencies, external stakeholder support and economic/social equity value. Top-ranked options from this initial screening were then regrouped and summarized. DEQ asked for an additional round of stakeholder review and input on these top-ranked options. That was followed by additional evaluation by staff. These final steps helped DEQ identify a select number of options that are included in this Strategic Plan.

While this Strategic Plan has been written primarily to guide actions for DEQ, reuse and repair are ultimately done not by the state, but by businesses and individuals. As such, the focus of the strategic plan is on providing assistance or creating conditions that encourage reuse and repair activities so that products and materials have longer useful lives. While the strategies and actions described below are informed by substantial research, in some cases additional research will be needed to help define the most effective course of action. Additionally, actions within this Strategic Plan may be implemented at varying times. Some are being implemented now; others will be started in the next year or in subsequent years. Some may not occur, if the additional research indicates they are not a prudent use of state resources. And finally, some will need to go back out to stakeholders for input on next steps.

Background

DEQ began this planning process with a review of literature and discussions with individuals drawn from across Oregon and beyond. Results of this research effort are provided in a separate Background Paper. Key findings are summarized below.

Environmental benefits

Materials (including products) have large and profound environmental impacts. One example of this is the emission of gases that contribute to climate change. Under the U.S. EPA's "systems based" inventory of the nation's greenhouse gas emissions, the production, transportation, and disposal of materials contributed 42 percent of all domestic emissions (13 percent food, 29 percent other materials).¹ This is considerably more than the emissions from any other system, including transporting people (24 percent of total) or heating, lighting, and cooling buildings (25 percent).

Separately, Oregon has estimated the global greenhouse gas emissions associated with satisfying economic demand by Oregon consumers. This "consumption-based inventory" provides insight into how consumption – a root driver of economic activity and, by extension, emissions – drives global emissions. In 2014, the direct consumption of materials contributed more (44 percent) to Oregon's consumption-based greenhouse gas emissions than any other major category of emissions, including services (23 percent), fuels (20 percent) or electricity (13 percent).²

¹ U.S. EPA Office of Solid Waste and Emergency Response, "Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices", <http://www.epa.gov/region-9-documents/opportunities-reduce-greenhouse-gas-emissions-through-materials-and-land>, September 2009.

² Oregon Department of Environmental Quality, "Fact Sheet: Oregon's 2005 – 2014 Consumption-Based Greenhouse Gas Emissions," March 2016.

While counting different emissions, both approaches confirm that emissions “upstream” of the consumer – in resource extraction, production, and, to a lesser extent, freight transportation – are much greater than emissions from disposal.

Reductions in greenhouse gases are not the only potential benefit of reuse. For example, a German study of recycling and waste prevention (including reuse) demonstrated that prevention and recycling conserves natural resources (such as iron ore and phosphate) and reduces a variety of pollutants.³

While both recycling and reuse (and repair) are promoted as methods of reducing waste, reuse typically is the environmentally preferable approach. Reuse maintains products in their original form and takes advantage of embodied energy, resources and impacts already incurred in the production of the original products. This is in contrast to recycling, which typically involves destroying the product and converting it into primary materials (resins, pulp, scrap metal, etc.) for use in making new products. While recycling is typically preferable to manufacturing from virgin resources, reuse offers significantly greater potential for conserving resources and reducing pollution. For example, a 2009 study in the U.K. found that best practices for extending the lifespan of products could reduce more than twenty times the greenhouse gas emissions than best practices for commercial and industrial recycling.⁴

Economic benefits

The economic benefits of reusing, repairing or otherwise extending the functional lifespan of a product can be measured at a variety of scales. Based on a 2013 report published by the Ellen MacArthur Foundation, a move to a circular economy, of which repair and reuse of products is a critical component, could result in an annual (for the U.K.) national-scale cost savings of approximately \$140 billion, or roughly 0.8 percent of that nation’s gross domestic product, in a conservative estimate.⁵

Few U.S. governments have collected data on the economic benefits of reuse, repair and product lifespan extension; however, the State of Minnesota, City of Portland (Oregon) and City of Eugene (Oregon) have published studies and reports containing data on the local economics of reuse and repair. Each report used slightly different parameters for study and analysis, but some summary findings were consistent among the three reports:

- Reuse and repair industries tend to be very local, and the benefits of their impacts are specific to the communities in which the actions take place.
- Most repair providers and reuse outlets are small, with one or two employees, but the bulk of the sales and economic activity are generated by a few large entities.

For example, the City of Portland was the case-study subject of a 2015 report on sustainable cities and their practices.⁶ Excluding activities related to motor vehicles, the top four reuse and repair sectors in Portland generated approximately \$163.9 million in gross sales annually.⁷ Those sectors were all repair-based, and did not capture the direct reuse, through resale or other mechanisms, of household and consumer goods in Portland. When evaluating the employment figures, the report showed that used merchandise stores were the largest single

³ Cascadia Consulting Group, Oregon DEQ Waste Prevention Strategy Background Paper #2: “Environmental Considerations: An Overview of the Benefits of Waste Prevention and Reuse,” December 2006.

⁴ Scott, Kate et. al., prepared for Waste & Resources Action Programme (WRAP), “Meeting the UK climate change challenge: The contribution of resource efficiency,” 2009.

⁵ The Ellen MacArthur Foundation, “Toward the Circular Economy, Volume 1: Economic and business rationale for an accelerated transition,” 2013, page 67.

⁶ Cascadia Consulting Group, for the Urban Sustainable Directors Network, “Sustainable Consumption and Cities: Approaches to measuring social, economic and environmental impacts in cities,” 2015.

⁷ Ibid. Page 36, Table 3

employer within the reuse and repair sector – excluding motor vehicle-related reuse and repair and online sales – employing 630 full-time workers in Portland.⁸

Identifying high-impact materials

Since not all materials have the same environmental impacts, the potential benefits of reuse or repair may vary across materials. Chapter 4 of the Background Paper provides a framework for prioritizing materials. A literature review suggests that textiles have significant impacts across their life cycle. Building materials, appliances, furniture, consumer electronics, and machinery also have significant impacts that may be mitigated through reuse, repair or remanufacturing. These materials may offer the greatest potential and as such may be good candidates for prioritization. However, there are a few circumstances where reuse should be avoided, such as for highly inefficient or polluting products.

Challenges and barriers

Oregon has a rich - but sometimes challenged - infrastructure that provides reuse and repair services, as well as some government programs that support reuse and repair. While new (2015) statewide statutory goals for waste generation shine a spotlight on waste prevention and reuse, many forms of material reuse are typically not highly profitable. In fact, many organizations involved in reuse are nonprofits with broader missions of community service. While used merchandise stores have grown in Oregon over the past twenty years, most traditional repair industries have contracted, in some cases by very significant amounts. The root driver of this downturn is competition from low-priced and typically difficult-to-repair products that simultaneously make repair both more difficult and more expensive when compared to replacement with a new product. Knowledge and information gaps, lack of access to skills or tools, insufficient infrastructure, and changes in consumption patterns all pose barriers to reuse and repair.

Strategies and Actions

The overarching goal of this Strategic Plan is to extend the lifespan of products in Oregon in a manner consistent with Oregon's 2050 Vision for Materials Management.

DEQ has identified four overarching strategies that will help the state achieve this goal:

- **Conduct foundational research**, which will inform actions and lead to more effective programs by DEQ and others.
- **Develop infrastructure and build capacity** so that repair and reuse are convenient and cost effective choices for households and businesses, and so that products and materials introduced into the market are appropriately durable and repairable.
- **Drive users to infrastructure**, including repair, reuse and durable products.
- **Provide policy support where needed.**

This Strategic Plan also proposes a focus on several specific materials, drawn from a longer list of materials identified for their potential for significant environmental impact (see Chapters 4 and 5 of the Background Paper). The materials emphasized in this Strategic Plan include:

⁸ Cascadia Consulting Group, for the Urban Sustainable Directors Network, "Sustainable Consumption and Cities: Approaches to measuring social, economic and environmental impacts in cities," 2015. Page 36, Table 4

- *Building materials*, in part because of their high volume, potential for significant human health and environmental impacts, existing infrastructure, and existing momentum and interest from businesses and local governments. Actions focusing on building materials include research and possible financial incentives or policies to support whole building reuse, financial and policy support for Oregon's growing deconstruction industry, and possible actions related to reducing human health impacts, including impacts related to lead and asbestos, associated with both demolition and deconstruction. *For additional information on building materials, see Appendix B of the Background Paper.*
- *Textiles*, largely because of their significant environmental impacts both upstream in manufacturing and supply chains and also related to disposal and reuse, as well as rapidly increasing material flows (use and disposal), growing private sector interest in durability and repair, and opportunities to engage with Oregon's apparel industry. *For additional information on textiles, see Appendix G of the Background Paper.*
- *Machinery and other products* that are potential candidates for remanufacturing, which constitutes a complete overhaul of a product and its parts to return it to "like new" or "better than new" condition. The U.S. remanufacturing industry is currently developing its own national roadmap, scheduled for completion in late 2017. *For additional information on remanufacturing, see Appendix E of the Background Paper.*

Other actions, including providing grants, developing purchasing standards, and supporting workforce development, are not material-specific but have potential overlap with both the materials listed above and other types of products or materials.

The actions (described below) contained in this Strategic Plan are drawn from a much longer list of over 120 different options that are described in the project's Background Paper. The actions chosen for inclusion in this Strategic Plan represent varying degrees of being "shovel ready" – some could lead to immediate changes, while other options (including some specific to textiles, remanufacturing, and "right to repair"), would require additional research as a first step.

Strategy 1: Support foundational research

While an initial round of research informed this Strategic Plan (see project Background Paper), additional information is needed in several priority areas. This foundational research will inform and shape actions in the other three strategies.

Material: Textiles

Action: Execute a series of research projects that provide essential information about fundamental system issues in textile reuse, repair and durability.

Textiles have significant environmental impacts, and the U.S. has seen a significant shift in patterns of clothing purchases in the last two decades. This shift has been characterized generally by lower retail prices, higher consumption, a shorter ownership cycle, and a flood of discards that is overwhelming the capacity of U.S.-based thrifts such as Goodwill. Appendix G of the Background Paper identifies a number of possible responses. However, additional information is first needed that better articulates the reasons why and when consumers discard textiles; where Oregon textiles donated for reuse actually end up; environmental differences between "fast fashion" and more durable clothing; and the potential reusability of textiles that are currently being disposed.

- **Objective:** Inform and optimize DEQ's investment by providing needed information to better understand barriers and levers that can be utilized to extend the lifespan of textiles through durability, repair, and reuse.
- **Possible outcomes:** Identify infrastructure needs and create a knowledge base on which DEQ and others can make decisions about potential future actions related to textiles. Please see the full suite of potential textile-related actions in Appendix G of the Background Paper.

Material: Building materials

Action: Research whole building reuse

Evaluate the environmental impacts of whole building reuse vs. building replacement for a variety of different types of non-residential buildings (either real or hypothetical) and produce a library of “reference buildings” that developers could refer to.

- **Objective:** Identify those circumstances where whole building reuse is environmentally preferable to demolition, in addition to meeting standards for human health and safety.
- **Possible outcomes:** This research could provide guidance to developers and property owners considering whole building reuse vs. replacement for non-residential buildings. In addition, the research might justify - or cause DEQ to discourage - financial incentives or policies to support whole building reuse. These might include tax credits, low-interest loans for qualifying projects, grants for environmental improvements (e.g., lead-based paint abatement), initial feasibility studies (“development pro formas”) to evaluate the economic potential of projects, or covering the administrative costs of issuing conservation easements on historic buildings.

Action: Evaluate the “price gap” between deconstruction and demolition through addressing environmental and health impacts and associated social costs.

Existing research clearly demonstrates that mechanical demolition of residential buildings can distribute lead dust into surrounding properties. Deconstruction is sometimes promoted as a means to reduce lead dispersion, but this has not been well studied. How do deconstruction and demolition compare? What is the risk of this dust plume compared to other sources of lead in the environment? And what are alternatives to mitigate it? A screening-level risk assessment can evaluate the potential impacts of lead dispersion from residential demolition and deconstruction. Field research (air, water, and land impacts) could then be undertaken to evaluate lead (and possibly asbestos) dispersion for a variety of dust suppression techniques used in deconstruction and mechanical demolition projects in Oregon.

- **Objectives:** Compare environmental and human health impacts of mechanical demolition and deconstruction; identify best practices in deconstruction and demolition techniques for lead and asbestos dust control and to better understand true social costs.
- **Possible outcomes:** Identify and promote best practices; review existing policy landscape of local demolition permits and requirements; advocate for deconstruction over demolition through social cost benefits (as indicated by the research); and explore improvements to asbestos survey standards in future DEQ asbestos rulemakings.

Material: Multiple materials

Action: Research the needs and gaps in priority industries (such as remanufacturing, textiles, building materials) for skilled worker development.

- **Objective:** To better prioritize where grant and other financial support mechanisms can best be spent in support of workforce development programs in specified trades and repair sector work. Repair and remanufacturing industries rely on skilled labor, and some report difficulty attracting and training new employees.
- **Possible outcomes:** This can potentially support multiple sectors and industries, most especially remanufacturing, furniture, textiles, electronics (computers/appliances) and building materials (deconstruction). Building local skill capacities and serving underserved populations could also be a focus. This work will require strong collaborative partnerships.

Action: Research opportunities specific to remanufacturing.

Remanufacturing is different from repair or refurbishment in that it constitutes a complete overhaul of the entire product and its parts to return them to "like-new" condition. Remanufacturing has the potential of being applied to a wide variety of products, including motors, engines, aircraft components, medical imaging devices, other machinery, tires, furniture, appliances, consumer electronics, and many other products. A 2012 study found that remanufacturing in the U.S. supported approximately 180,000 jobs⁹, and that the industry was growing at a rapid rate. Remanufacturing jobs also tend to require moderate to high skills, and pay accordingly. The U.S. Remanufacturing Industries Council is engaged in a national strategic planning effort to advance remanufacturing in the United States. A national "roadmap" is expected in late 2017.

- **Objective:** Review the national roadmap and identify priority needs that Oregon might address through program or policy changes.
- **Possible outcomes:** To be determined; might include, for example, programs or policy changes related to workforce development, economic development, business retention and development, or state procurement.

Action: Explore the concept of "Right to Repair" and potential policy responses.

"Right to Repair" is a movement that encourages the extension of the useful life of products through repairing, upgrading, and customizing. It requires design that considers disassembly and modularity to allow component swapping for maintenance, upgrade or customization – all actions that can keep a product's serviceable life going for much longer than otherwise. Right to Repair also explicitly challenges part of the profit motive associated with planned obsolescence.

- **Objective:** DEQ would need to begin this work by establishing relationships with others interested in Right to Repair to better understand the current national strategy, context and direction of the movement. DEQ could provide support for additional research, including case studies of high turnover products that are amenable to upgrade, repair and reuse, and evaluation of potential policy responses. *For additional information on right-to-repair, see Appendix F of the Background Paper.*
- **Possible outcomes:** To be determined; might include, for example, support for policy changes to establish or protect consumers' right to repair.

Strategy 2: Develop infrastructure and build capacity

Reuse and repair require infrastructure, including organizations (both for-profit and not-for-profit) that repair or collect and redistribute reused goods. This strategy involves developing and supporting that infrastructure to provide convenient and cost-effective options for residents and businesses.

Material: Multiple materials

Action: Provide grants for infrastructure and capacity

An existing competitive grants program provides grants for a variety of projects related to waste prevention, reuse, and recovery. DEQ intends to continue this grants program in the future. In the most recently-completed grant round (2015), reuse/repair projects generally scored highly (representing six of 15 awardees and 44 percent of the total funds awarded). In 2016, DEQ began allowing non-profit organizations to apply directly (historically, DEQ offered grants only to local governments, which often passed funds through to local non-profits). Recently-passed legislation (2015) allows DEQ to offer grants to any legal person; in future years, DEQ may open grants opportunities to private businesses as well. DEQ can focus grant funds in several different ways, and may use this

⁹ U.S. International Trade Commission, "Remanufactured Goods: An Overview of the U.S. and Global Industries, Markets, and Trade", 2012.

authority to achieve more targeted results in future years. In any event, the grants program will continue to be an important tool to help financially support reuse, repair and product lifespan extension activities across the state.

- **Objective:** Provide financial assistance to support organizations that provide reuse and repair services.
- **Possible outcomes:** More, more widespread, and more effective infrastructure for reuse and repair.

Material: To be determined

Action: Provide grants or other financial support mechanisms for workforce development, based on outcomes of research

A number of repair and remanufacturing industries rely on skilled labor, and some report difficulty attracting and training new employees. DEQ may provide financial support to priority sectors after researching the needs and gaps in the current workforce development and apprenticeship models (see research action described earlier). This work would be implemented in collaboration with partners such as Oregon’s Bureau of Labor and Industries, Business Oregon, Department of Education, community colleges and local trade organizations and businesses. Possible priority materials or sectors include building materials, textiles, and remanufacturing. DEQ is already providing financial support for a workforce development program to support building deconstruction in the City of Portland. There is private-sector interest in textile repair, and the remanufacturing industry has identified availability of skilled workers as an “extremely important” factor affecting the ability of remanufacturers to compete in U.S. markets for several market segments.¹⁰

- **Objective:** Support workforce development in the repair and remanufacturing sectors.
- **Possible outcomes:** Build local skill capacities, serve underserved populations, build strong collaborative partnerships, and develop industry capacity.

Action: Provide technical and other assistance to businesses

DEQ will consider providing technical and other assistance to businesses engaged in repair, reuse, or design of products meeting criteria for durability, repairability or reusability. This assistance could include, for example, evaluation of environmental impacts, pilot testing and evaluation, or financial assistance. Assistance will be determined on a case-by-case basis.

- **Objective:** Support business initiatives in repair, reuse, and product lifespan extension.
- **Possible outcomes:** More effective repair and reuse options; products designed for greater durability, repairability or reusability.

Material: Single-use packaging

Action: Evaluate water bottle filling stations in public schools as a waste prevention option

Many public schools serve or sell drinking water in single-use disposable bottles. While these bottles can be recycled, DEQ’s research shows that drinking water in a reusable bottle can have vastly smaller environmental impacts.¹¹ However, refillable bottles can be difficult to fill in older-style water fountains, and restrictions on sales of bottled water can backfire, driving up consumption of less healthy options such as soda. DEQ is currently designing a pilot project with a medium-sized school district to test the impact of making reuse more convenient through the placement of water bottle filling stations.

- **Objective:** Evaluate behavioral, environmental, and social impacts of several different interventions aimed at decreasing sales of single-use water bottles in schools.
- **Possible outcomes:** Depending on the results of the pilot, DEQ could consider micro-grants or other incentives for additional schools.

¹⁰ U.S. International Trade commission, “Remanufactured Goods: An Overview of the U.S. and Global Industries, Markets, and Trade,” 2012.

¹¹ Franklin Associates prepared for Oregon DEQ, “Life Cycle Assessment of Drinking Water Systems: Bottled Water, Tap Water, and Home/Office Delivery Water,” October 2009.

Strategy 3: Drive users to infrastructure

While Strategy 2 provides a "supply push" that will advance reuse and repair by improving infrastructure quantity and quality, Strategy 3 complements this with "demand pull" from consumers and governments. As an example, government purchasing may help to create demand for durable, repairable, remanufactured or reused goods.

Material: To be determined

Action: Provide grants for market development

As described above, DEQ has new statutory authority allowing it to issue grants to non-profits and businesses directly, but the law does not require DEQ to do so. DEQ will consider offering grants to support market development for reuse and repair. One example might be capital to support "value added" applications of building materials (e.g., furniture). Similarly, several reuse organizations in Oregon have identified a need to streamline and improve inventory management systems in order to more effectively market used materials to more customers.

- **Objectives:** Better utilization of reused materials in "value added" applications and increased market demand across consumer sectors.
- **Possible outcomes:** Development of "value added" businesses, such as furniture construction and allowing reused material stores to sell larger quantities (such as through an on-line inventory system that allows contractors to order larger quantities of reused dimensional lumber without having to visit multiple sites and pick items by hand).

Material: All

Action: Support reuse, repair and durability considerations in public procurement.

As part of its initial implementation of Oregon's 2050 Vision for Materials Management, DEQ is already committed to advancing sustainable materials management in purchasing practices by state and local governments. A new staff position will serve as a subject matter expert and conduit of environmental information to Oregon's Department of Administrative Services (DAS) and other public sector purchasers. DAS is committed to considering lifespan extension issues on a case-by-case basis.

- **Objectives:** Increase state and local government purchases of goods that are remanufactured, reused, or designed with durability, repairability or reusability considerations, where appropriate.
- **Possible outcomes:** As examples, the state and local governments could review and revise purchasing standards in support of remanufactured (e.g., medical equipment, office furniture) and durable products (e.g., office furniture). This may generate financial savings in addition to environmental benefits.

Action: Support community-scale education about reuse, repair and product lifespan extension.

Senate Bill 263 (2015) created new requirements of Oregon's larger cities and counties related to waste prevention and reuse. Cities and counties will be required to select and implement actions chosen from a list of options. These options include community-wide promotion about the benefits of prevention and reuse broadly, as well as targeted campaigns focused on specific waste prevention actions (which, due to statutory definitions, include product lifespan extension through durability considerations, but not reuse). DEQ will support these local governments with information on priority actions, updating and refreshing educational messages, and creating outreach campaigns and materials for local governments to adapt and use.

- **Objective:** Improve consumer knowledge and adoption of best practices for product lifespan extension, including reuse, repair, and durability.
- **Possible outcomes:** Shelf-ready campaigns with professional quality collateral available for use in local outreach campaigns.

Strategy 4: Provide policy support where needed

State or local policies are potentially powerful methods of appropriately extending the lifespan of products. This strategy holds most policy options in reserve for later years so that they can be informed by foundational research (Strategy 1), infrastructure development (Strategy 2) and "demand pull" market development activities (Strategy 3).

Examples of possible policy initiatives include support for remanufacturing businesses and remanufactured products; tax credits for whole building reuse; advancing best practices for dust suppression in both deconstruction and demolition activities; and policies related to "right-to-repair" such as requiring that manufacturers make diagnostic codes available or reverse recent declines in product durability by providing extended base product warranties.

Timeline and adaptive management

This Strategic Plan is intended to cover a six-year period, although the actions contained within it will be implemented at varying times. Some are being implemented now, others will start in the next few years, and some will need additional research, which may or may not determine that the original action should be implemented. Strategies, actions and projects fulfilling this Strategic Plan will be assessed at regular intervals; depending on the results of these assessments, adjustments - including project closures - will be made. In addition, new projects or approaches may be added if exceptional new opportunities develop or are identified.