

2. Introduction

2.1 Preamble

This report is a culmination of a two year effort by 29 Portland Air Toxics Solutions (PATs) advisory committee members and DEQ, representing the largest and most diverse stakeholder groups in DEQ's history. Between August 2009 and October 2011, the committee worked to develop a comprehensive air toxics plan with aggressive reduction goals for the Portland region. Developing the PATs emission reduction plan was a long and technically difficult process that is unique in Oregon and nationally. According to the committee charter, the goal for the final report was to catalogue a set of consensus recommendations. Throughout the two year process, committee members discussed and advised DEQ on methods of analysis, emission reduction goals, prioritization of emission sources, environmental justice impacts, potential actions, and a blueprint for next steps. DEQ drafted recommendation language for the committee in an attempt to capture the full range of committee member perspectives.

At their last meeting in October 2011, committee members and DEQ discussed the most accurate and beneficial way to represent committee discussions and accomplishments in the context of diverse opinions and the lack of consensus. DEQ initially proposed to author its own report incorporating the input of committee members. However, for greatest transparency, and to recognize the extensive contributions of committee members, DEQ has chosen to present the PATs report as a committee work product. While the recommendations included in the report reflect best efforts at consensus, the report does not imply endorsement by all members. Committee members' comments and letters are included in [Appendix 12.13](#). In addition, DEQ will be conducting a public comment process on the PATs report and recommendations to be summarized and presented to the Environmental Quality Commission.

2.2 Background – Description of Community Based Air Toxics Reduction Project

2.2.1 Objectives and Progress

The Portland Air Toxics Solutions (PATs) project is a community-based air toxics reduction effort under the state Air Toxics Reduction Program in Oregon Administrative Rules 340-246-0010 through 0230. (see [Appendix 12.1](#)) The purpose of Portland Air Toxics Solutions (PATs) is to improve public health by meeting or making progress towards air toxics risk reduction goals. The objectives of PATs are to:

- Designate the Portland area as the first Air Toxics Geographic Planning Area;
- Use data to clearly describe emissions, risks and reduction opportunities;
- Conduct a representative stakeholder process that addresses Portland air toxics needs, regulatory requirements, and community values;
- Produce an emission reduction plan that meets OAR 340-246 criteria and is clear, realistic and measurable;
- Reduce risk from air toxics; and
- Develop a model geographic planning process that could be used in other Oregon communities.

To accomplish PATs objectives, DEQ formed Portland Air Toxics Solutions Advisory Committee (PATsAC), a broad based stakeholder group. The PATsAC membership is included in Table 1. PATsAC advised DEQ on a broad range of topics, including study methodology, data sources, and potential emission reduction strategies. EPA and DEQ data show that some sources of air toxics are area-wide, such as motor vehicles, wood stoves, and other citizen related activities. Other air toxics have impacts on localized areas. The dispersed, widespread nature of most of the emissions makes reducing air toxics challenging. In order to successfully reduce risk posed by area-wide air toxics, it is critical to involve local governments, nonprofits, business leaders,

neighborhood groups, and residents in the area to form partnerships and collaborations that will reduce emissions in the community.

The 29 member PATSAC provided DEQ with a wide cross section of views and expertise, and helped DEQ develop a roadmap or next steps to address air toxics in the Portland area. DEQ and the committee had many challenging discussions about the fundamental science of air toxics, estimating emissions and risk, options for reducing emissions, and many other technical, economic and community considerations influencing strategy choices. DEQ's expertise in air toxics, as well as the state air toxics program greatly benefitted from this challenging work.

DEQ sincerely acknowledges and lauds the great progress and advances made as a direct result of PATSAC work. PATSAC reviewed the study methodology, data sources, emissions and modeling results. During review and discussion of the technical study, PATSAC members voiced many perspectives and suggested improvements that added high value to both the technical study and process of developing an emission reduction plan. While it proved difficult to accomplish all of the goals ambitiously stated in air toxics regulations, PATSAC enabled DEQ to analyze and develop an understanding of toxics problems and potential solutions in the Portland area. In addition to this analysis, PATSAC helped DEQ develop:

- A priority list of air toxics categories;
- White papers that lay an initial technical foundation for future emission reduction strategies;
- Definition of key considerations;
- Future steps for technical analysis; and
- Future steps for stakeholder involvement, including representation and consideration of environmental justice issues.

DEQ also acknowledges and values the many collateral advances resulting from PATSAC work. DEQ could not have achieved these significant results without the effort, expertise and perseverance of PATSAC members. These advances include:

- A practical approach to screening and understanding Toxics Release Inventory data for permitted facilities;
- An enduring data quality ranking system; and
- DEQ's first air quality Environmental Justice analysis using census and GIS based data.

The complexity and broad scope of air toxics in the study area were challenges to DEQ and the committee in developing a full and detailed air toxics reduction plan as originally envisioned under the Geographic Approach of the Oregon Air Toxics Regulations. DEQ and PATSAC spent ten of their fourteen meetings working through data issues to develop a common understanding of air toxics sources and problems in the study area. While the PATS advisory committee was large at 29 members, the broad spectrum of sources considered in the technical study included interests that went beyond committee representation. During the process it became clear to DEQ and PATSAC members that additional stakeholder consultation is needed to thoroughly consider emission reductions in individual priority categories. This consultation will allow development of more detailed technical information and more complete consideration of affected stakeholder interests.

In developing emission reduction plans for high priority categories, DEQ will continue to strive towards the objectives stated above and in the program regulations. Section 2.4 of this report discusses next steps for developing and implementing the Portland Air Toxics Solutions Plan. Section 9 includes identification of source categories, recommendations for emission reduction options and guidance for future stakeholder consultation.

2.2.2 Scientific Foundation for PATS

PATS began in response to knowledge gained from the U.S. Environmental Protection Agency's (EPA) National Air Toxics Assessment¹ (NATA) and the Portland Air Toxics Assessment² (PATA). NATA models pollution impacts on a nation-wide scale, and PATA modeled information specific to the Portland Metro area. Information on air toxics risk gained from both NATA and PATA helped in the selection of a geographic area for strategic reduction of air toxics.

Based on ranking of county air toxics risk statewide, DEQ selected the Portland area as the first community to participate in geographic air toxics reduction planning. While the risk from air toxics in the Portland region is similar to other large urban areas around the country, DEQ selected this area because it has the highest public health risk from air toxics in Oregon. The PATS project and study area includes portions of Multnomah, Clackamas and Washington Counties. DEQ also involved Clark County Washington near Vancouver and a portion of Yamhill County, since these areas share the same air shed as the Portland metro area.

Air toxics are pollutants suspected or known to cause serious health problems including cancer, birth defects, organ damage and respiratory irritation. Sensitive populations, which include children, older adults, people who work outdoors, athletes who exercise outdoors, people with asthma or other breathing problems and heart disease, are especially vulnerable to air toxic emissions.

There are many different pollutants in the Portland air shed, including criteria pollutants with federally mandated air quality standards and air toxics with no federal ambient standards. Pollution levels fluctuate with the season, weather, and community behavior patterns. While the Portland-Vancouver air shed met all existing federal standards for criteria pollutants at the time of this report, various air toxics are above Oregon benchmark levels, or are projected to be above benchmarks levels in 2017. In order to determine which pollutants will be above air toxics benchmarks and understand their emission sources, DEQ modeled air toxics for 2005 and a projected year of 2017, and considered monitoring data for the Portland area.

PATS is distinct from other air toxics control efforts to date because it evaluates risk holistically to produce an area-wide plan to decrease emissions from sources roughly commensurate with their contribution to problems. DEQ's collaboration with a diverse advisory committee and other interested stakeholders provides a representative public the opportunity to work with DEQ and build partnerships to implement the emission reduction strategies for the PATS study area.

At the time of this report, DEQ has exhausted the funding for ongoing air toxics work. However, because air toxics are produced by many of the same sources that produce, particulate, ozone precursors and greenhouse gases, DEQ will link efforts to reduce all of these pollutants in a comprehensive approach. While DEQ will coordinate local air toxics reduction plans, it is also relying on partnerships and collaborations with local agencies and communities for resources and for strategy implementation.

2.3 Program History and Context

Historically, EPA and DEQ have focused on criteria pollutants³, which are six air pollutants with federal standards or limits. In the past, the criteria pollutants carbon monoxide, ground level ozone, and particulate matter were above federal ambient concentration standards in the Portland area. DEQ has successfully reduced these pollutants below federal standards, so that the Portland-Vancouver air shed currently meets all federal criteria pollutant air standards; and DEQ works with businesses and the public to maintain these air standards.

¹ <http://www.epa.gov/nata/>

² <http://www.deq.state.or.us/aq/toxics/pata.htm>

³ Criteria pollutants are ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur oxides and lead.

Air toxics make up a second category of pollutants that have no federal concentration limits but, through typically long term, low-level exposure, pose the risk of serious health problems such as cancer, organ, nervous system, or respiratory damage. As more science on air toxics emerged, EPA responded by developing national control requirements for various categories of industrial emissions. In the Federal Clean Air Act, the EPA lists 187 toxic or hazardous air pollutants to reduce from industry and business activity. At this level, EPA has established many regulations that specifically decrease air toxics from large industries to small businesses. EPA has also established many regulations for new on-road vehicles (like cars and trucks), off-road vehicles (like construction equipment, trains and recreational boats), and small portable engines (like generators and landscape equipment). While the focus of these regulations is to minimize the emission of criteria pollutants, they also reduce air toxics. The federal program is far-reaching; however, it does not address the emissions of air toxics from the larger pool of existing vehicles, equipment and other unregulated sources in communities, or risk from cumulative emissions caused by many sources in urban areas. Even with fully phased-in federal standards to reduce air toxics, communities will still experience levels of air toxics above Oregon's health-based benchmarks. To address the need to lower risk from air toxics, Oregon implements its own risk based air toxics program to supplement federal efforts.

To implement the state of Oregon program, DEQ employs a three-part system to address all sources of air toxics. First is a focus on categories of sources or activities that emit air toxics statewide, like woodstoves, diesel engines, and open burning. These are known as sector strategies. Second, the geographic strategy (such as the Portland Air Toxics Solutions) focuses on communities where people experience the most risk, in larger cities and highly populated areas. Third is an opportunity to address the rare case where pollutants from a specific facility are not fully controlled and pose problematic levels of risk to people living nearby.

In 2003, the Environmental Quality Commission⁴ adopted Oregon's state air toxics program. (See [Appendix 12.1](#) for air toxics regulations and program information) At the heart of the Oregon geographic strategy is the idea of evaluating risk holistically from all sources in an urban area, and developing an area-wide plan to reduce risk from point, area and mobile sources commensurate with their contribution to emissions above clean air goals. The program is also designed to address risk from source categories or individual sources that are not otherwise regulated by federal standards.

In 2006, the program took a major step forward when the Environmental Quality Commission adopted ambient benchmark concentrations (ABC) for 51 air toxics in Oregon. The benchmarks are set at levels protective of human health over a lifetime of exposure, and are based on recommendations of our Air Toxics Science Advisory Committee. The benchmarks serve as both measurement tools and goals, allowing analysis of air toxics problems, prioritization of projects, and tracking of progress in risk reduction in the absence of federal standards. The ABCs are expressed as annual average concentrations that would protect human health during a lifetime of exposure. The Air Toxics Science Advisory Committee reviews the ABCs at least every five years, or more frequently if important new health or scientific information arises.

2.4 PATSAC Purpose and Charter

In August 2009, DEQ convened PATSAC, a broad based stakeholder group tasked with recommending the elements of a Portland air toxics reduction plan to DEQ and the Environmental Quality Commission. The purpose of the committee was to conduct a representative stakeholder process to address Portland air toxics needs, regulatory requirements, and community values; and to produce a set of recommendations that met emission reduction goals and regulatory requirements and that are clear, realistic and measurable. DEQ met with this diverse advisory committee and other interested stakeholders to develop an air toxics reduction

⁴ The Environmental Quality Commission is a five-member citizen panel appointed by the governor to four-year terms, serving as Department of Environmental Quality's (DEQ) policy and rulemaking board.

strategy that fosters innovation, improves partnerships, and builds support to carry out emission reduction strategies. PATSAC included representatives from neighborhoods, public interest organizations, government health and transportation departments and business. PATSAC considered the best available science and information available at the time. The PATSAC Charter and Operating Principles can be found in [Appendix 12.2](#).

2.4.1 Process

Requirements for a local air toxics advisory committee, such as PATSAC, are contained in Oregon Administrative Rules 340-246-0170 (1) through (4). See [Appendix 12.1](#) for Oregon rules related to air toxics. PATSAC met 14 times from August 2009 to October 2011. Throughout the process, the committee collaborated with DEQ to improve the quality of technical information, discuss prioritization of emission categories, and explore potential emission reduction options. A detailed description of the PATSAC process is found in section 2.4.1.2.

The PATS effort focused on air toxics measured or modeled above ambient benchmarks in the study area. While reducing the highest risk air toxics was a priority for PATSAC and DEQ, the committee also considered multi-pollutant benefits, including green house gas and criteria pollutant reductions, as well as many other considerations described in section 2.4.3.2 of this report. PATSAC evaluated air toxics emissions from all types of sources.

State air toxics regulations state that when feasible, PATS emission reduction plans will be designed to reach air toxics levels that are equal to or below ambient benchmark concentrations as expeditiously as possible, with a base goal of 10 years from the date of Environmental Quality Commission approval. Because emission reduction next steps reached the point of identifying priority categories, each with a roadmap for further stakeholder work and reductions, this report does not include a proposal for specific reduction requirements, milestones or ten year goals. These elements will be incorporated for each priority category in future collaboration with an additional stakeholder process.

"Feasibility" is not defined in DEQ's air toxics regulations, but is generally understood to require consideration of practical, economic, social, scientific, and health factors for each pollutant and associated source. Because diesel particulate matter, polycyclic aromatic hydrocarbons (PAH), and benzene are produced by engines and combustion sources, which are ubiquitous, it may not be feasible to reduce emissions quickly enough to reach benchmark levels within ten years from approval of an emission reduction plan. Background pollutants also affect the feasibility of reaching benchmarks, especially for pollutants with a high level of atmospheric formation, like formaldehyde and acetaldehyde.

Once DEQ and partners establish emission reduction plans, DEQ will periodically evaluate progress using both monitoring and modeling data. For pollutants that cannot be monitored, only modeling will be used. For those that can be monitored, DEQ will still rely primarily on modeling data and check it against monitored values. Unlike monitoring data, which is limited to measuring only the area near the monitor, modeling data provides estimates for every census block in the entire PATS study area.

2.4.1.1 Representation

DEQ greatly appreciates and values the time, interest and effort of PATSAC members and ex-officio members who attended 14 meetings over a two year period. Table I below shows PATS membership at the time of the committee's final meeting in October 2011. Workload and employment shifts caused some change in membership during the PATS project, but the majority of core interests were consistently represented. DEQ also thanks members who served on the committee for part of the process: Jeri Williams, Portland Office of Neighborhood Involvement, Jennifer Baldwin, American Lung Association of Oregon, Mark Turpel, Metro

Regional Government, Steve Mason, The Boeing Company and Charles Lapin, Western States Petroleum Association.

Table 1: PATS Advisory Committee Members as of October 17, 2011

Lisa Arkin, Oregon Toxics Alliance	Debra Dunn, Oregon Trucking Associations	Sandra Galganski, Oregon Metal Industry Council
Aubrey Baldwin, Pacific Environmental Advocacy Center	David Farrer, Oregon Public Health Division	Jim Norman, Oregon Department of Transportation
Nick Bouwes, North Portland	Warren Fish, Multnomah County Office of Sustainable Development	John Ostar, OPAL
Matt Bihn, Metro Regional Government	Toby Harris, Washington County Health Department	Mary Peveto, NW Portland Neighbors for Clean Air
Dan Bower, Portland Department of Transportation	Eric Hesse, TriMet	Eben Polk, Clackamas County Office of Sustainability
Dave Breen, Port of Portland	Dona Hippert, Oregon Toxics Alliance	Vivek Shandas, Portland State University
Daniela B. Cargill Southwest/Downtown Portland	Charles Lapin, Western States Petroleum Association	Scott Stewart, Intel Corporation
Ben Duncan, Multnomah County Health Department	Sia Lindstrom, Washington County Administrative Office	Carter Webb, Associated Oregon Industries
Carrie Nyssen, American Lung Association		

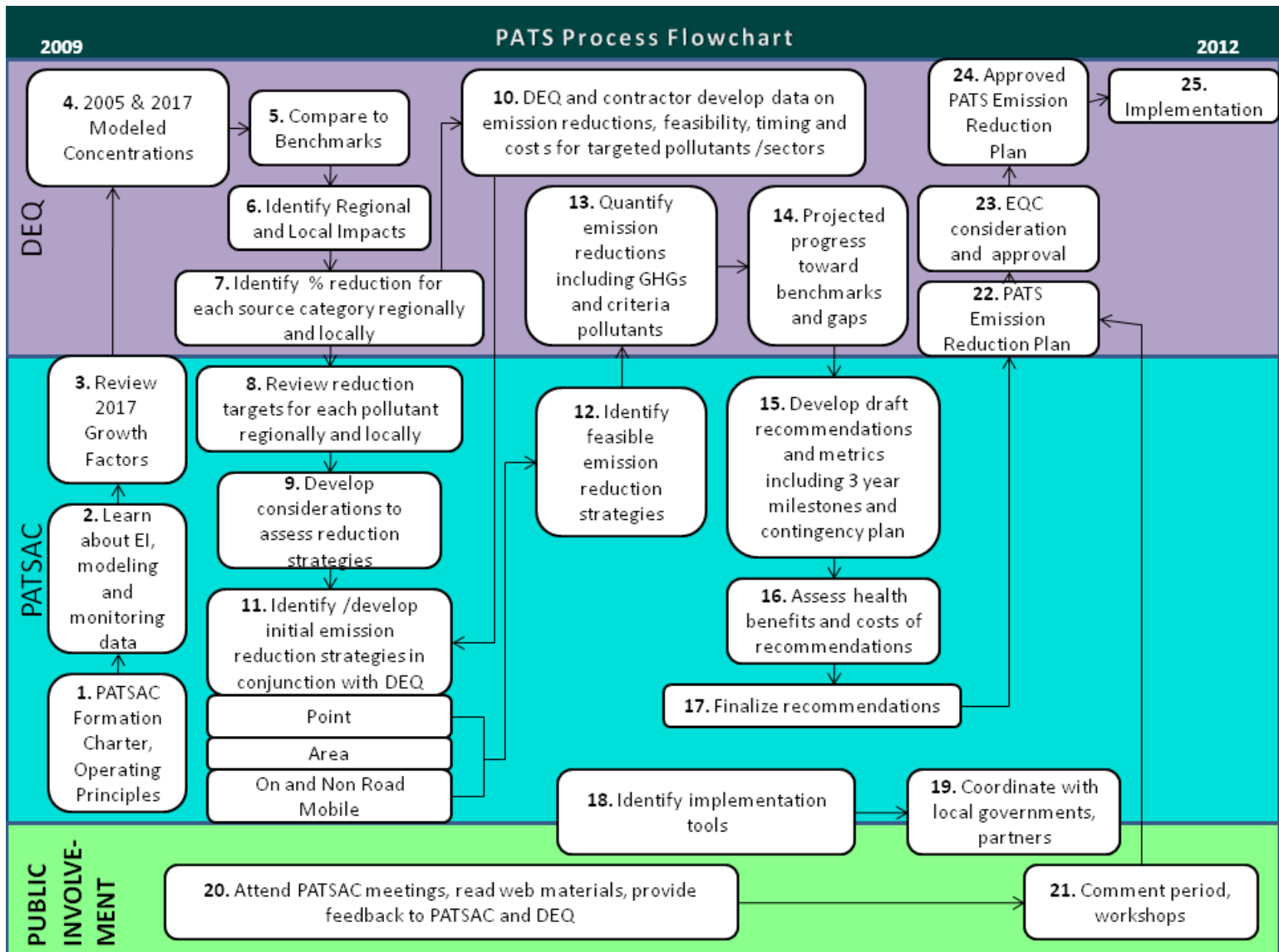
PATS Advisory Committee Ex-officio Members

Merlyn Hough, Lane Regional Air Protection Agency	Natalia Kreitzer, Southwest Clean Air Agency	Michael McNickel, Yamhill County Public Health
Bob Palzer, Sierra Club		

2.4.1.2 PATS Process Flowchart

Figure 1 illustrates the PATS process. The Process Flowchart is divided into three categories of activity: DEQ's, PATSAC's, and interested persons or the public. For reasons described in 2.2.1, Objectives and Progress, PATS reached partially into step 15 of the flowchart. The steps in the flowchart are described below.

Figure 1: PATS Process Flowchart



1. The first PATSAC step was formation, charter and operating principles. (See [Appendix 2.2](#))
2. A concurrent early and ongoing step for the committee was building an understanding of data DEQ has developed to inform the PATS process. This data includes:
 - DEQ Air Toxics Benchmarks ([See section 3.2](#))
 - Emission Inventory (2005 base year, 2017 projection) ([See section 3.4](#))
 - Modeling (2005 base year, 2017 projection) (See [section 3.5](#) for an overview and [section 4](#) for modeling results)
 - Monitoring (2005 base year) ([See section 3.6](#))
3. PATSAC and DEQ reviewed draft 2017 growth assumptions for air toxics in the PATS study area. ([See section 3.4](#)) This information is the foundation and base case for understanding source category contributions and emission reduction strategies. 2017 growth assumptions include:
 - Projections for economic recovery and growth, including population growth
 - Existing emission control regulations
 - Emission control regulations to be phased in from 2011 to 2017

4. After PATSAC gave DEQ feedback to fine-tune the 2017 growth assumptions, DEQ used the emission inventory and the PATS model to generate 2017 estimated concentrations. 2005 was used as a base to estimate 2017. ([See section 3.5](#) for a modeling overview and [section 4](#) for modeling results)
5. DEQ compared 2017 modeled concentrations throughout the PATS study area to ambient benchmark values, which serve as air toxics clean air goals. DEQ compared modeled concentrations rather than modeled exposures to the benchmarks. Air toxics regulations direct DEQ to use concentrations to determine progress toward benchmarks, which is more conservative and protective of human health. Modeled concentrations also compare better to monitoring data. [See section 4](#) for further discussion of modeled concentrations vs. modeled exposure concentrations.
6. DEQ's analysis of modeling data considered average concentrations across all census tracts, as well as localized impacts in much smaller areas of one to several census tracts.
7. & 8. DEQ calculated how much emission reduction is needed for each pollutant for each source category both regionally and locally, expressed as percentages. The reduction targets for each category are roughly commensurate with source category emission contributions. The targets do not take feasibility or economics into consideration, but serve as starting point for proposed reductions.
9. PATSAC developed criteria or considerations to evaluate emission reduction strategies. Several emission reduction plan criteria are listed in the air toxics rules. PATSAC also developed other important considerations for implementing emission reduction strategies. Several considerations became core concepts to evaluate potential reduction strategies. (See section 2.4.3)
10. & 11. Through brainstorming, assistance from DEQ's contractor Eastern Research Group and consultation with partners, PATSAC and DEQ developed a comprehensive list of potential emission reduction strategies. (See [section 6](#) and [Appendix 12.9](#)) DEQ and Eastern Research Group analyzed emission reduction strategies for priority categories in a series of white papers. This assured that PATSAC could consider a full array of emission reduction options and have more detail in technical areas than DEQ would otherwise be able to support. DEQ and the contractor developed white papers detailing potential emission reduction strategies. (See [section 6](#) and [Appendix 12.9](#))
12. PATSAC discussed roughly commensurate reductions from all categories and applying core considerations to engage in discussions towards draft recommendations. (for information on core considerations, see section 2.4.3) Because of the large number of sub-categories and pollutants, this was a high-level approach allowing a framework for future development.
13. The white papers quantify emission reductions from strategies where possible, including greenhouse gases, ozone and particulate. (See [section 6](#) and [Appendix 12.9](#)).
14. The white papers contain information on potential emission reductions and potential gaps between emission reductions achievable and the target benchmarks. (See [section 6](#) and [Appendix 12.9](#))
- 15, 16 & 17. Considering committee comments, DEQ drafted the next steps for emission reductions. Health benefit assessment, milestones and contingency planning will follow as DEQ and partners are able to address emission reduction planning for priority categories.
- 18 & 19. During development of the emission reduction plan, DEQ and the committee identified implementation tools and coordination with local governments and partners needed for implementation. DEQ requested that committee members begin the process of coordinating with their organizations and working to identify implementation tools early in the process.
20. In the area of public involvement, DEQ encouraged interested persons to engage in the meetings, become informed and provide feedback. A public comment period was held at every meeting. Committee members were responsible to engage with their affiliated colleagues and interested persons.
21. After assembling a draft proposal, DEQ will host public workshops and conduct a comment period on the recommended plan.
22. DEQ will take PATSAC recommendations and public input to form a final proposal for PATS emission reduction planning.

23 & 24. The Environmental Quality Commission will have an opportunity to learn about, discuss and approve the final PATS emission reduction plan.

25. Because air toxics are produced by many of the same sources that produce, particulate, ozone precursors and greenhouse gases, DEQ will work with partners to link efforts to reduce all of these pollutants in a comprehensive approach to maximize co-benefits.

2.4.2 Elements of the PATS Emission Reduction Plan

The following plan elements are identified in Oregon Administrative Rule (OAR) [340-246-0170](#). PATSAC considered each of these possible plan elements in discussing potential emission reduction strategies. These elements will continue to guide development of emission reduction strategies for priority categories.

Voluntary and Mandatory Strategies. The plan may contain a mix of voluntary and mandatory emission reduction strategies that may be administered region-wide or in separate jurisdictions. Depending on the type of source, the plan may include public education, pollution prevention, economic incentives and disincentives, technical assistance, local ordinances and DEQ regulations.

Proportionality. The plan must include emission reduction measures that are roughly commensurate with source contributions, considering relative emissions, toxicity, exposure, technical feasibility, cost effectiveness, public health and the economic impacts air toxics have on public health and equity. The plan will include commensurate reductions from point, area and mobile sources. The commensurate contribution from any particular source or source category will vary depending on whether the impacts are evaluated at a regional or local level. Both scales are valid and must be evaluated.

Milestones. The PATS emission reduction plan will include milestones to be evaluated by DEQ and PATSAC representatives. If DEQ finds lack of progress at designated milestones, it will consult with PATSAC to evaluate the need for corrective measures.

Regulatory Coordination. The plan elements must be coordinated with other local, state and federal requirements to the extent possible.

Data Elements. If necessary, the plan will include specific recommendations to develop ongoing emissions inventory or ambient monitoring to track local air toxics trends.

Address Wide-Spread and Localized Impacts. The plan must include strategies to reduce concentrations of air toxics above ambient benchmark concentrations in smaller portions of the geographic area, as well as pollutants causing risk above benchmarks throughout the study area.

Contingency Plan. The plan must include a contingency plan to be implemented if the year six evaluation shows lack of progress toward milestones and is projected to fall short of the ten year goals. The contingency plan must include, but is not limited to, re-evaluation of planning assumptions, evaluation of existing conditions and effectiveness of emission reduction strategies and new or progressively more stringent strategies to be considered.

2.4.2.1 Issues Included in PATSAC Consideration

In considering emission reduction strategies, PATSAC used monitoring and modeling analyses to understand air toxics in the study area, including distribution of concentrations, causes, and potential solutions. PATSAC considered solutions for the entire study area as well as smaller areas where people are exposed to air toxics above benchmarks because of localized source emissions. Based on DEQ's environmental justice analysis,

PATSAC also began to consider adverse impacts on sensitive or vulnerable populations and environmental justice communities.

2.4.2.2 Issues not Directly Related to PATSAC Recommendations

To focus the scope of the PATS project, DEQ did not seek direct recommendations on the issues listed below. However, DEQ documented committee input on these issues and, when possible, will refer them for follow-up in an appropriate forum.

- Ambient benchmark concentrations
- Statewide air toxics regulations
- Conditions to be placed directly in the permit of a specific regulated source, though strategies may include pollution reductions from types of stationary sources identified as significant contributors to ambient concentrations and exposures above benchmarks.
- Worker exposure
- Measures specifically designed to improve indoor air quality

2.4.3 Emission Reduction Considerations/Criteria

The advisory committee and DEQ used “core” considerations, as well as a number of other important considerations, in developing recommendations. The core considerations include the magnitude of reductions achieved by a strategy, the timeframe to reduce emissions, the technical feasibility of a strategy, and the cost of a strategy. All of the considerations are listed in section 2.4.3.2.

2.4.3.1 PATS Threshold Regulatory Requirements

DEQ regulations directed DEQ and the advisory committee to focus in certain areas:

- The PATS emission reduction plan must focus on air toxics measured or modeled above ambient benchmarks in the PATS study area. (OAR 340-246-0170 (4)(1))
- Mandatory emissions reduction strategies must be commensurate with source contributions, considering relative emissions, toxicity, technical feasibility, cost-effectiveness and equity. (OAR 340-246-0170 4(f)). The methodology for considering percent reduction targets used percent contributions for each category and ranked them according to total risk achieved commensurate reduction goals.

2.4.3.2 Considerations

PATSAC and DEQ developed a list of considerations as an informal tool to evaluate toxics reduction strategies. DEQ expects that these considerations will be useful to future stakeholder groups tasked with developing emission reduction strategies.

1. Effectiveness

- a. **Magnitude:** amount of each air toxic reduced by the strategy.
- b. **Timeframe:** Length of time required by strategy to reduce emissions. How readily are results measureable? (OAR 340-246-0179 4(d))
- c. **Effect on exposures:** How well does the measure target spatial extent of the emissions? Some reductions may have more pronounced effects on localized concentrations; others may do more to reduce pollutants area-wide. (OAR 340-246-0170 4(g)). Ability to address short term or acute exposures if relevant.
- d. **Pollution prevention:** Where does the strategy fit in the pollution prevention hierarchy? 1. Modify the process, raw materials, or product to reduce the quantity and toxicity of air contaminants generated. 2. Capture and reuse air contaminants. 3. Treat to reduce the quantity and toxicity of air contaminants released. (OAR 340-246-0050)
- e. **Other pollutants:** Effect of measure on criteria pollutant emissions, greenhouse gas emissions, and

2. Implementability/Feasibility/Barriers

- a. **Legal authority:** Does the measure fall under existing regulations or are new laws/ rules required? Does federal pre-emption preclude new laws/rules? Is/will the proposed measure be addressed through other planned Federal, state, or local rulemaking or other processes?
- b. **Technical feasibility:** How well will the emission reduction measure work from an engineering and/or logistical perspective? Is the technology or fuel readily available? (OAR 340-246-0170 4(f)). Is the technology EPA or third party verified/certified?
- c. **Funding:** What is the cost to DEQ or other agency to implement the measure? How could the agency cost be funded? How certain is the funding mechanism?
- d. **Implementation:** Is there a ready structure for implementation or ability to coordinate with existing programs?
- e. **Acceptance:** Is there public and stakeholder support for the measure?
- f. **Non-regulatory approaches:** Could the measure be implemented through incentives or education? Is there an opportunity to implement the measure through a community-based multi-stakeholder collaborative process? Could the measure begin as voluntary and later become mandatory as necessary in a contingency plan?

3. Cost

- a. **Cost:** What is the cost of emission reduction measure and implementation (OAR 340-246-0170 4(f))? If the measure is a regulation, what is the cost of compliance? If the measure is an incentive, what is the cost of the incentives?
- b. **Cost effectiveness:** What is the cost per unit of air toxics reduced?
- c. **Other environmental impacts:** Potential for the emission reduction measure to transfer pollutants to soil or water, or cause harm to human health or the ecosystem.
- d. **Energy:** Effect of measure on energy use.
- e. **Public safety:** What is the affect of the measure on public safety? For example, would emission reductions restrict activities related to adequate lighting, heat, ventilation, signage or access to emergency services?
- f. **Indirect economic costs:** What are the potential indirect costs to communities, the local economy or business sectors?

4. Benefits

- a. **Health:** What are the health benefits of meeting the benchmarks? This could be measured as the number of cancer cases avoided and/or value of statistical life and medical costs avoided.
- b. **Livability:** Improved quality of life associated with improved nuisance conditions such as odor or noise.
- c. **Indirect economic benefits:** What are the potential benefits to communities, the local economy or business sectors?

5. Distribution of Benefits and Costs

- a. **Risk distribution:** Could the measure change the social distribution of risk in the PATS area, i.e. sensitive populations and environmental justice communities?
- b. **Cost distribution:** Could the measure impose disproportionate costs or economic impacts to environmental justice communities in the PATS study area?

2.5 Next Steps and Implementation

2.5.1 The Plan is a Framework

The framework of the Portland Air Toxics Solutions plan relies on three action pathways that strategies and recommendations can follow. These are: (1) strategies that are ready to implement, (2) strategies that need refinement prior to implementation, and (3) strategies to improve the information for a pollutant. The three action pathways are described in detail below and illustrated in Figure 2 on page 13. For information on the prioritized source categories and recommended strategies, please refer to [section 9, “Next Steps.”](#) Given the reality of implementation timeframes and resource limitations, DEQ will only be able to commence strategies as resources allow.

2.5.1.1 Ready to Implement Emission Reduction Strategies

These strategies are well defined, do not require additional development or rule authority, and can be implemented immediately or have begun and are directly related to PATS goals. Examples include:

- Point – The ESCO metal facility “alternatives analysis” process. ESCO negotiated directly with the Northwest District Association and Neighbors for Clean Air regarding a number of emission control improvements. The final negotiated improvements and implementation schedule were incorporated into ESCO’s Title V permit renewal.
- Area – Area source NESHAPs (recently adopted), Heat Smart Rules (wood stove rules). With NESHAPs, there is a three-year duration for the NESHAP inclusion into the permit and compliance by the source.

2.5.1.2 Strategies That Need Refinement

This action pathway includes strategies need further scoping, rulemaking, funding, development, or data refinement. This also includes source categories where a strategy or strategies needs to be selected to achieve emission reductions. In many cases, DEQ will need to convene advisory committees related to the specific source sectors, and possibly the source categories themselves. The members of these committees may include members of PATSAC, in addition to technical support staff and local government staff. Each of these committees would be tailored to the expertise that would be most appropriate for aiding in the development or selection of the strategy. Examples include:

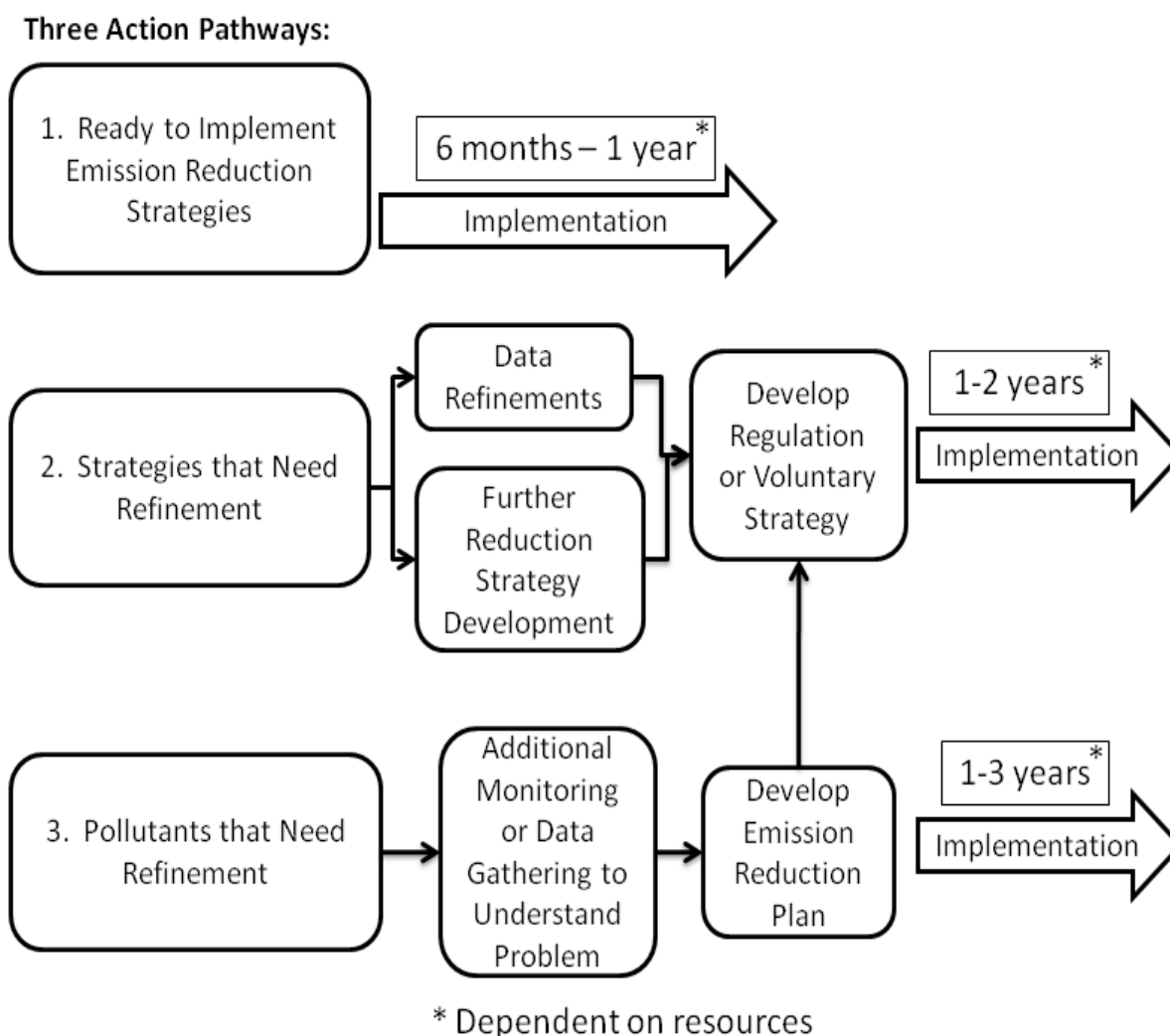
- Area – Strategy implementation of any rule or incentive program would require further development.
- Mobile – Vehicle miles travelled reduction strategies (Metro) are currently under development, but analysis will continue beyond 2011 (House Bill 2001).
- Point – The strategies will be identified here at the framework level, but will be referred to another advisory committee potentially resulting in a rule for the specific point source. It typically takes up to one year for data refinements, another year for the rule making, and up to a two additional years for compliance.

2.5.1.3 Pollutants That Need Refinement – Monitoring, Research, or Data Gathering to Understand Problem

This action pathway includes recommendations for additional monitoring or data gathering to understand various pollutants and problems. This implementation pathway is resource intensive, requiring analyses from agency staff as resources allow. Examples include:

- Methylene chloride – the emission factors from the EPA need refinement. DEQ will need to better understand how much methylene chloride is still in use in the Portland area.
- Cadmium – understanding emission sources in the PATS study area.

Figure 2: Three Action Pathways for PATS Recommendations



2.5.2 Environmental Quality Commission Approval and Public Comment

Following a notice and public comment period, DEQ will present the PATS air toxics emission reduction plan to the Environmental Quality Commission. Because the plan will address many pollutants from many source categories through many emission reduction strategies, it will serve as a framework for reducing air toxics within the PATS study area. If the Environmental Quality Commission approves the plan, DEQ will work with local governments, other state agencies, the Oregon Legislature, the federal government and others to develop the programs needed to implement the plan. This work will take additional time, and will include additional advisory committees engaged in recommending emission reduction strategies.