

DRAFT Sediment TMDL Road Management Outline

I. Mid Coast Implementation-Ready Sediment Total Maximum Daily Load:

Road Network Desired Outcomes & Multi-Sector Approach

This document describes the goals and requirements for reducing sediment pollution from road systems in the Mid-Coast basin under the Oregon Department of Environmental Quality's (DEQ's) Implementation-Ready Total Maximum Daily Loads (IR-TMDLs) for the basin. It provides an overview of the major road ownership/management types and describes the overarching framework for reducing sedimentation from roads in the Mid Coast basin.

The intent of this portion of the sediment IR-TMDLs is to (a) prevent chronic or frequent introduction of fine sediment from the road network into waters of the state and (b) to reduce the risk of episodic sediment introduction from roads that were constructed using methods and/or in locations that may fail catastrophically and be problematic for water quality. DEQ's road approach, which includes assessment and management measures, applies to all land uses. However, in recognition of existing regulatory regimes and inherent differences in management methods and use patterns, there are detailed Road Management Approaches for three road sectors: Forestry, Agriculture, and Public Roads (i.e. state highways and county and municipal roads).

All land management sectors contain existing road segments or features that represent a risk of anthropogenic sediment delivery to waters of the state in the MidCoast Basin. The effect of roads as a source of fine sediment and other pollutants, and as a contributor to changes in hydrology, geomorphology, and fish passage is well documented for urban or rural residential roads (e.g. Paul & Meyer 2001, Konrad & Booth 2005, Walsh *et al* 2005), agricultural roads (e.g. Ziegler *et al* 2000, Scheetz & Bloser 2009), and forest roads (e.g. Reid & Dunne 1984, Jones *et al* 2000, Reiter *et al* 2009). Since all road-related sediment delivery to waters of the state is necessarily from anthropogenic sources, this category of sediment is a concern for attainment of water quality standards and resource protection and must be minimized to the maximum extent practicable. Water quality improvements from changes in road construction and management practices are likewise documented and available (e.g. Scheetz & Bloser 2009, Reiter *et al* 2009), and there are available guidance materials and Best Management Practices for planning, design, construction, and maintenance. This program consists of measures to identify roads that are considered at risk of delivering sediment or turbidity to waters of the state, to bring the road network to a level of performance that is consistent with TMDL goals and objectives, and thereby reduce and prevent water quality impacts and protect beneficial uses.

Sediment TMDLs Goals & Objectives

Water Quality Goals

- No more than 10% increase in turbidity due to roads at relevant compliance points, e.g. downstream of crossing structures or due to road-related landslides (Turbidity Standard: OAR 340-041-0036).
- No impairment of aquatic life and drinking water use due to anthropogenic sedimentation (Biocriteria, Potability of Drinking Water, and Sediment narrative standards: OARs 340-041-0011, 340-041-0007(11), and 340-041-0007 (12), respectively).

Road Network Goals

- An efficient and beneficial road network that is located, designed, constructed, and managed in a manner that provides protection to water quality
- No exceedance of water quality standards due to roads, crossing structures, and their use by the public and commercial traffic.
- Hydrologically disconnected road network (to the maximum extent practicable) using available BMPs (including maintenance practices) and good design principles.

Road Network Objectives

- The road network meets current requirements and guidelines of the relevant statutes and regulations (e.g. Forest Practices Act and rules for forestry roads and use, Agricultural Water Quality Management Act (SB 1010) Area Rules for agricultural roads, applicable state laws and county ordinances for state highways and county roads) as the primary basis for achieving water quality goals for sediment.
- Road maintenance operations are performed as needed including regular inspections and timely repair of storm damage.
- Any existing problem road locations are identified by landowner or manager by segments or features.
- In some cases, existing rules do not require proactive improvement of the road network to achieve water quality goals for sediment. Road managers implement practices that exceed current rules & guidance, such as Oregon Plan voluntary measures, where necessary to meet water quality goals for sediment.
- Road system owner/operator identifies problems or risks from crossings, road prism failure, hydrology, and connectivity (specific problem/risk categories by land ownership/management can be found in the sector-based road approaches).
- Identified problems and risks in the road network are remediated according to TMDL timelines and milestones.
- Road system owner/operator reports actions taken by:
 - Category of problem or risk, and
 - Problem/Risk (by appropriate unit of measurement).

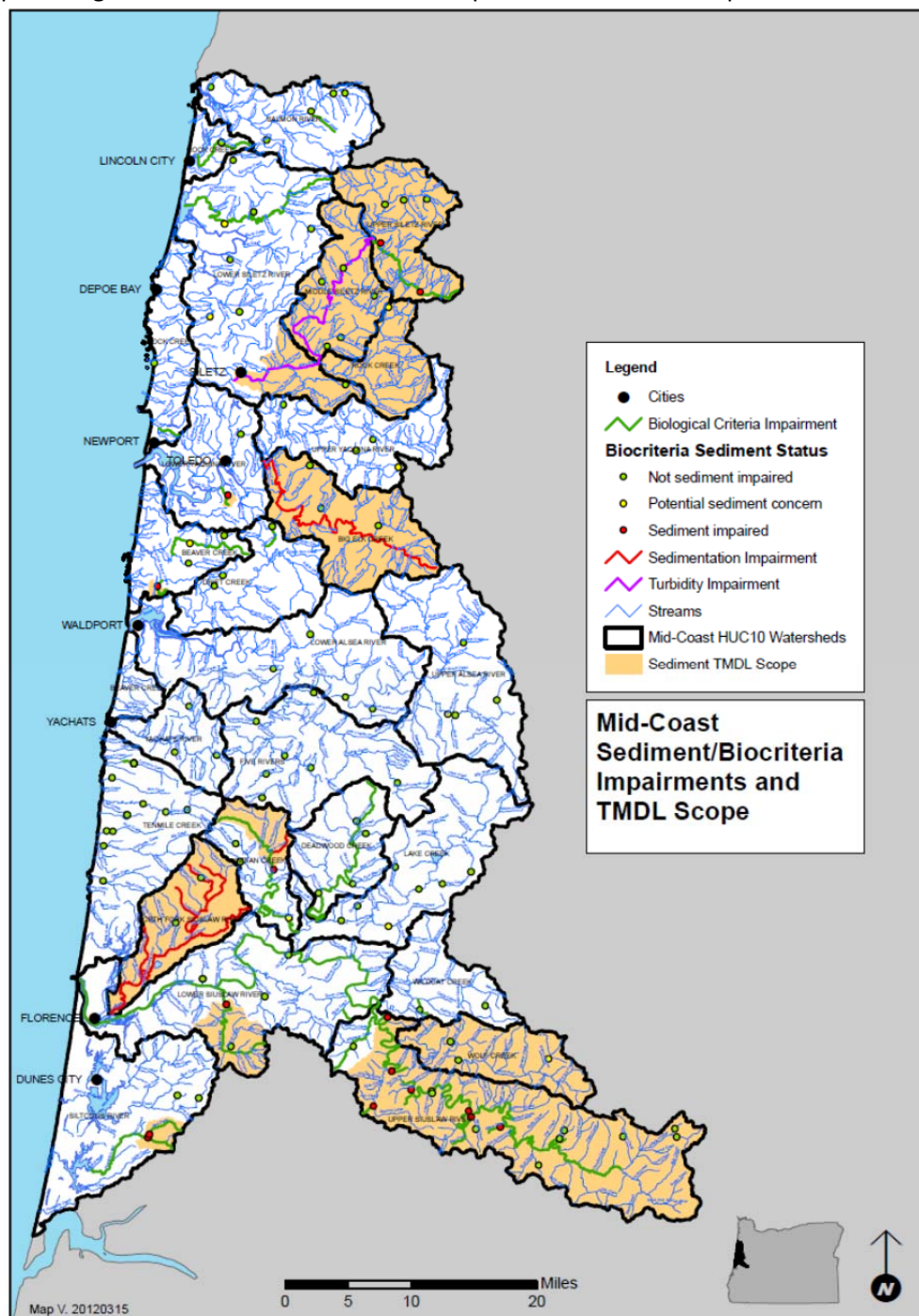
For each Problem/Risk, landowner reports:

- Initial Number;
- Number Completed in Current Year (total and number per 5th or 6th field Hydrologic Unit Code (HUC));
- Number Completed to Date;
- Percent Completed to Date;
- Number Remaining to Complete;
- Number Expected to be Completed in Upcoming Year (total and number per 5th or 6th field HUC).

Reporting on a project-by-project basis may be possible through the Oregon Watershed Enhancement Board's Oregon Water Resources Inventory (OWRI) reporting mechanism. This would allow DEQ to download data as a means of getting yearly reporting from landowners rather than direct submission of reports to DEQ. The OWRI system would need minor modifications; DEQ will work with OWEB to coordinate and streamline reporting of improvements.

Geographical Scope of IR-TMDL

The sediment portion of the Implementation-Ready Total Maximum Daily Load (IR-TMDL) load allocations and management measures apply to the areas identified on the 2010 303(d) list and the areas with identified biocriteria impairments associated with excess sedimentation. These areas are shown on the map below. The requirements of the IR-TMDL for sediment do not apply to the remainder of the Mid-Coast basin, but DEQ encourages implementation and the use of this approach basin-wide. Basin-wide (or coastal zone-wide) approach: landowner could develop a Section 319 watershed Nonpoint Source plan, either alone or in collaboration with other partners and stakeholders. DEQ can provide guidance and assistance in development of a watershed plan.



Process Outline:

Stratify roads by risk type → Categorize risk/impact → Identify BMPs → Implement BMPs → Track implementation & monitor water quality

Road Management Approach Components:

Each sector's road management approach has the following components:

- Develop a working definition of which roads are covered by a sector's approach, and develop a set of criteria to determine which roads/segments have potential to deliver sediment to streams.
- Develop reporting metrics needed to establish pre-Oregon Plan baseline (when applicable) & current situation and to track progress through implementation of BMPs.
- All road network owners/managers must identify sediment delivery locations or road locations/features that are at risk of failure and delivery to waters of the state. A summary of that data will be submitted to DEQ as part of the implementation plan. Inventories done under the Oregon Plan for Salmon and Watersheds can be submitted and used as the baseline for purposes of compliance with milestones, although updated information will be required as well.
- Along with inventory summary, road managers will need to submit a plan that projects when the problems and risks will be remediated in a manner that meets the milestones in the implementation timeline (Table 1). Basic plan components and structure will be outlined in the sector-based approaches. Alternate plan formats are allowable if overall planning goals are met.
- The TDML will include Best Management Practice (BMP) references as options for managing and remediating problems and risks. Use of these BMPs will constitute the approved implementation activities under the TMDL. Alternate BMPs are allowable if the owner/manager demonstrates to DEQ that these will likewise accomplish the water quality goals.
- Annual reporting is needed in order to summarize the work done over that year on the problems/risks identified, the total work done, and the work remaining (See "Objectives" above). The data, timelines, and the BMPs included in the TMDL will be developed and selected in consultation with stakeholders and/or outside experts. Mechanisms to facilitate reporting (e.g. through OWRI) are a priority.

Table 1: Implementation Timeline & Milestones

Calendar Year	TMDL Year	Action Milestone
2013	0	TMDL Approved
2015	2	Inventory & Assessment Under Way; Start Road Work
2017	4	Inventory & Assessment Completed; Improvement & Removal Plan Submitted
2019	6	-
2021	8	25% of Plan Work Completed
2023	10	-
2025	12	50% of Plan Work Completed
2027	14	-
2029	16	75% of Plan Work Completed
2031	18	-
2033	20	100% of Plan Work Completed

The three road sector approaches (Forestry, Agriculture, and Public Roads) will share the above described components. However, the specific means to accomplish those components (initial data, projected work, reporting, BMPs & implementation) will be tailored to the management practices, land use needs, particular water quality impacts/risks, and regulatory structure of the sector. For example, the Forest Roads Approach will have BMPs to address roads built using sidecast construction on steep slopes; agricultural roads will generally not have this risk, but operators will need to address rainy season use of inadequately surfaced roads near to surface water similarly to forest road system operators. Therefore, the three sector-based approaches will have issues in common as well as issues unique to a particular sector. The timeline and milestones will be common to all three approaches. Public roads, agricultural roads, and forest roads are all expected to meet water quality goals and road network goals and objectives.

Clarification of Responsibility:

Generally, the owner or designated land manager/land management agency is responsible for compliance with the requirements of this TMDL, and the applicable road sector approach is determined by land use. Some cases of ambiguity exist as to which sector some roads belong. Examples include driveways and private roads in subdivisions and similar developments. Driveways are to be covered under the Agricultural Roads Management Approach. Private roads in subdivisions and similar cases that do not qualify as driveways will be covered under the Public Roads Management Approach through

county authorities. Financial responsibility would rest with the party who is legally responsible for maintenance of those private roads.

There will also be cases where one party owns the land, and another party owns a right-of-way on that land. If responsibility is unclear (i.e. no agreements exist on who is responsible for road maintenance, and established laws do not assign responsibility), then the owner of the right-of-way is the default responsible party for road maintenance and upgrades.

Following this introduction, there are three sector-based Road Approaches. These Approaches constitute the load allocation surrogates and required management measures for the roads component of the Mid Coast Sediment TMDLs.

References:

- Jones, JA, FJ Swanson, BC Wemple, and KU Snyder. 2000. Effects of roads on hydrology, geomorphology, and disturbance patches in stream networks. *Conservation Biology* **14**: 76-85.
- Konrad, CP, and DB Booth. 2005. Hydrologic changes in urban streams and their ecological significance. Pages 157–177 In (eds Brown LR, Gray RH, Hughes RM, Meador MR) *Effects of Urbanization on Stream Ecosystems*. Symposium 47. American Fisheries Society, Bethesda, Maryland.
- Paul, MJ, and JL Meyer. 2001. Streams in the urban landscape. *Annual Review of Ecology and Systematics* **32**: 333–365.
- Reid, LM and T Dunne. 1984. Sediment production from forest road surfaces. *Water Resources Research* **20**: 1753-1761.
- Reiter, M, JT Heffner, S Beech, T Turner, and RE Bilby. 2009. Temporal and spatial turbidity patterns over 20 years in a managed forest of Western Washington. *Journal of the American Water Resources Association* **45**: 793-808.
- Scheetz, BE, and SM Bloser. 2009. Environmentally sensitive maintenance on agricultural roads to reduce nutrient and sediment pollution in the Kishacoquillas watershed. Thomas D. Larsen Transportation Institute, Pennsylvania State University, Report NRCS68-3A75-5-167.
- Walsh, CJ, TD Fletcher, and AR Ladson. 2005. Stream restoration in urban catchments through redesigning stormwater systems: Looking to the catchment to save the stream. *Journal of the North American Benthological Society* **24**: 690–705.
- Ziegler, AD, RA Sutherland, and TW Giambelluca. 2000. Partitioning total erosion on unpaved roads into splash and hydraulic components: The roles of interstorm surface preparation and dynamic erodibility. *Water Resources Research* **36**: 2787-2791.

II. Forest Roads Management Approach

Meetings with ODF (Coordination, Scoping, Informational):	January-August, 2012
Initial Draft to TWG:	August 15 th , 2012
Forest Roads Sub-Group Meeting:	September 5 th , 2012
Assessment Metrics for Forest Roads to TWG & LSAC:	September 18 th & 19 th , 2012

Current Activities:

Revising draft document to incorporate TWG, LSAC, and Sub-Group suggestions & information
Reading and evaluating forest roads references/resources

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III. Agricultural Roads Management Approach

Agricultural Roads Sub-Group Meeting:
Meeting Notes & Basic Outline to Sub-Group:

October 10th, 2012
November 19th, 2012

Current Activities:

Writing initial draft document.

Reading and evaluating agricultural/rural roads references/resources

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IV. Public Roads Management Approach

Public Roads Sub-Group Meeting:

November 29th, 2012

Meeting Notes & Basic Approach Outline to Sub-Group:

December 19th, 2012

Current Activities:

Writing initial draft document

Reading and evaluating materials provided by ODOT and Lane County, other references

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