



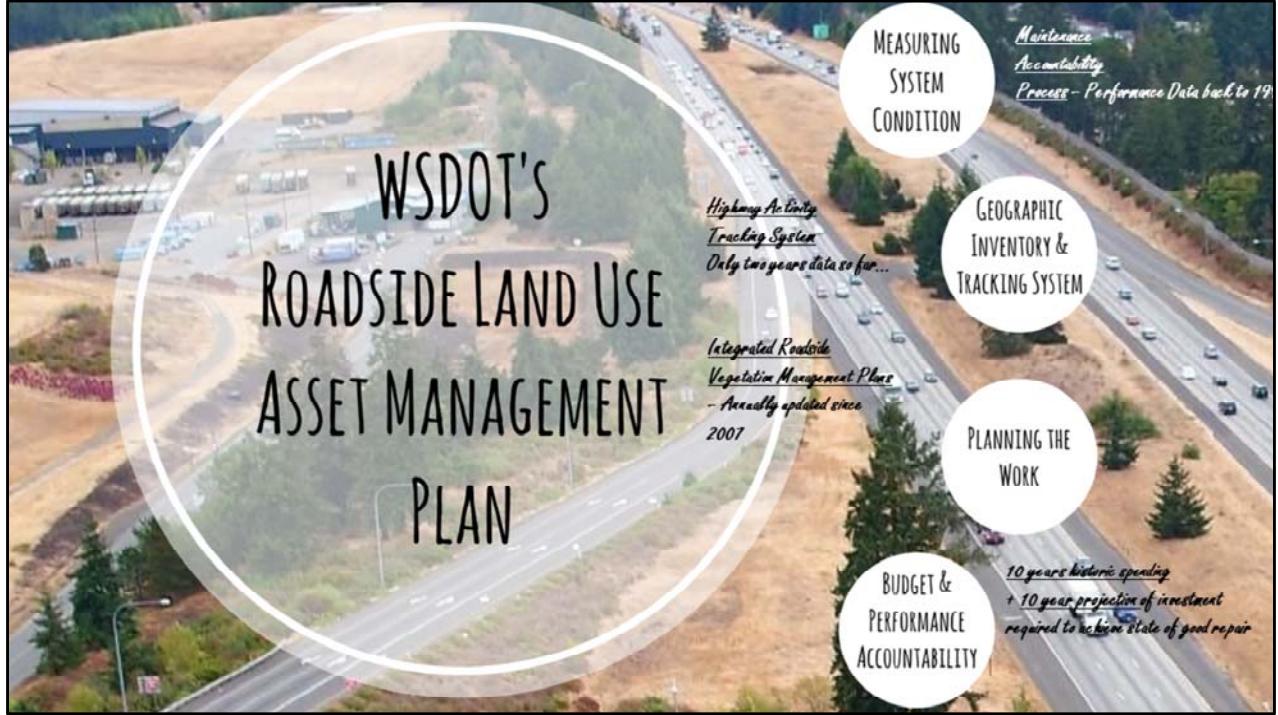
The term “Asset Management” is being thrown around these days as the latest business concept/strategy for any type of systems management, but it’s really nothing new, but the way humans go about the business of land management has evolved significantly over the years. An “asset” is nothing more than a thing that has value, and all we’re talking about in Asset Management is finding the most practical way of taking care of the “thing”. What has changed recently is we can now apply technology that allows us to be much more informed and accountable when we go about the business of taking care of stuff. With land management assets GIS and mobile data technologies are transforming business models. By applying mobile GIS technologies to plan, execute, and track maintenance crew activities, we can get closer than ever to the most practical solutions for taking care of our stuff.

The two major types of work associated with the ongoing maintenance of roadsides are litter control and vegetation management. This presentation will focus vegetation management.

What we’ve been able to do at WSDOT over that past 20 years or so has been to gradually develop a fairly comprehensive asset management system for the design and maintenance of the roadside vegetation. The recent Asset Management Planning initiative within WSDOT has allowed us to capitalize on this work and present a thorough analysis of

condition, cost, and resulting values of our state's roadsides. What we will be showing in this presentation is how our agency's Roadside Land Use Asset Management Plan is using geographic data on the measured condition of the roadside over time, together with Integrated Vegetation Management Planning, mobile technology, and an accurate inventory of planned and accomplished treatments, to project the economic and environmental benefits from our roadsides over time. And to show how those benefits can change depending on our level of investment in ongoing maintenance.

* Backdrop image is one example of an existing roadside on I-5 that has been maintained in a state of good repair and at the lowest annual maintenance cost...



Briefly explain each of the four components and how we've addressed them with our maintenance program management. The point is –The data generated by the first three is necessary to develop credible program performance projections with varying levels of investment. Our current plan is based on a 10 year window to restore all our “deficient” roadsides to a state of good repair, and our rough estimate to do this is about \$10 million a year. Once the entire right of way is established with the appropriate native/naturalized vegetation, the cost of taking care of the roadside comes back down the most efficient and practical levels. The rest of the presentation will be an explanation of how we're attempting to use these processes and the data they are generating, to justify an investment by Washington State, in accomplishing the most practical solutions for roadside management.

Mention risk workshop for roadside issues

The Future of Washington's Roadsides: Filling the Growing Gap between State of Good Repair and Current Roadside Condition

Vegetation Maintenance Expenditures Calendar Years 2015 thru 2018 Compared to the Previous 5 Year Average



Statewide Vegetation Maintenance											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$1,397,210	\$8,710	\$1,344,428	\$1,221,981	\$1,741,996	\$1,297,171	\$11,464,840	2%	-1%	-6%	-7%
2016	\$1,412,007	\$78,749	\$1,470,756	\$1,766,896	\$1,617,138	\$916,666	\$11,472,748				
2017	\$1,475,410	\$81,440	\$1,470,370	\$1,451,381	\$1,449,098	\$1,443,832	\$10,794,145				
2018	\$1,716,198	\$1,201,471	\$1,178,708	\$1,221,209	\$1,111,410	\$1,764,538	\$11,864,819				
5 Year Average	\$1,128,174	\$1,251,204	\$1,408,703	\$1,209,274	\$1,633,118	\$1,153,115	\$11,261,138				

State & Hwy											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$20,110	\$11,171	\$20,930	\$193,893	\$140,287	\$211,740	\$1,043,618				
2016	\$20,110	\$11,171	\$20,930	\$193,893	\$140,287	\$211,740	\$1,043,618				
2017	\$20,110	\$11,171	\$20,930	\$193,893	\$140,287	\$211,740	\$1,043,618				
2018	\$20,110	\$11,171	\$20,930	\$193,893	\$140,287	\$211,740	\$1,043,618				
5 Year Average	\$20,110	\$11,171	\$20,930	\$193,893	\$140,287	\$211,740	\$1,043,618				

Safety-Minimum											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$724,188	\$13,326	\$710,862	\$700,400	\$124,874	\$1,111,710	\$1,760,975				
2016	\$724,188	\$13,326	\$710,862	\$700,400	\$124,874	\$1,111,710	\$1,760,975				
2017	\$724,188	\$13,326	\$710,862	\$700,400	\$124,874	\$1,111,710	\$1,760,975				
2018	\$724,188	\$13,326	\$710,862	\$700,400	\$124,874	\$1,111,710	\$1,760,975				
5 Year Average	\$724,188	\$13,326	\$710,862	\$700,400	\$124,874	\$1,111,710	\$1,760,975				

Safety-Trimming and Tree Removal											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$1,028,706	\$18,014	\$1,010,692	\$770,403	\$181,684	\$1,414,169	\$1,464,038				
2016	\$1,040,348	\$18,014	\$1,022,334	\$787,787	\$181,293	\$1,414,169	\$1,464,038				
2017	\$1,040,348	\$18,014	\$1,022,334	\$787,787	\$181,293	\$1,414,169	\$1,464,038				
2018	\$1,040,348	\$18,014	\$1,022,334	\$787,787	\$181,293	\$1,414,169	\$1,464,038				
5 Year Average	\$1,028,706	\$18,014	\$1,010,692	\$770,403	\$181,684	\$1,414,169	\$1,464,038				

Roadside Weed Control											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$16,110	\$48,600	\$16,110	\$187,480	\$187,209	\$404,118	\$1,464,246				
2016	\$16,110	\$48,600	\$16,110	\$187,480	\$187,209	\$404,118	\$1,464,246				
2017	\$16,110	\$48,600	\$16,110	\$187,480	\$187,209	\$404,118	\$1,464,246				
2018	\$16,110	\$48,600	\$16,110	\$187,480	\$187,209	\$404,118	\$1,464,246				
5 Year Average	\$16,110	\$48,600	\$16,110	\$187,480	\$187,209	\$404,118	\$1,464,246				

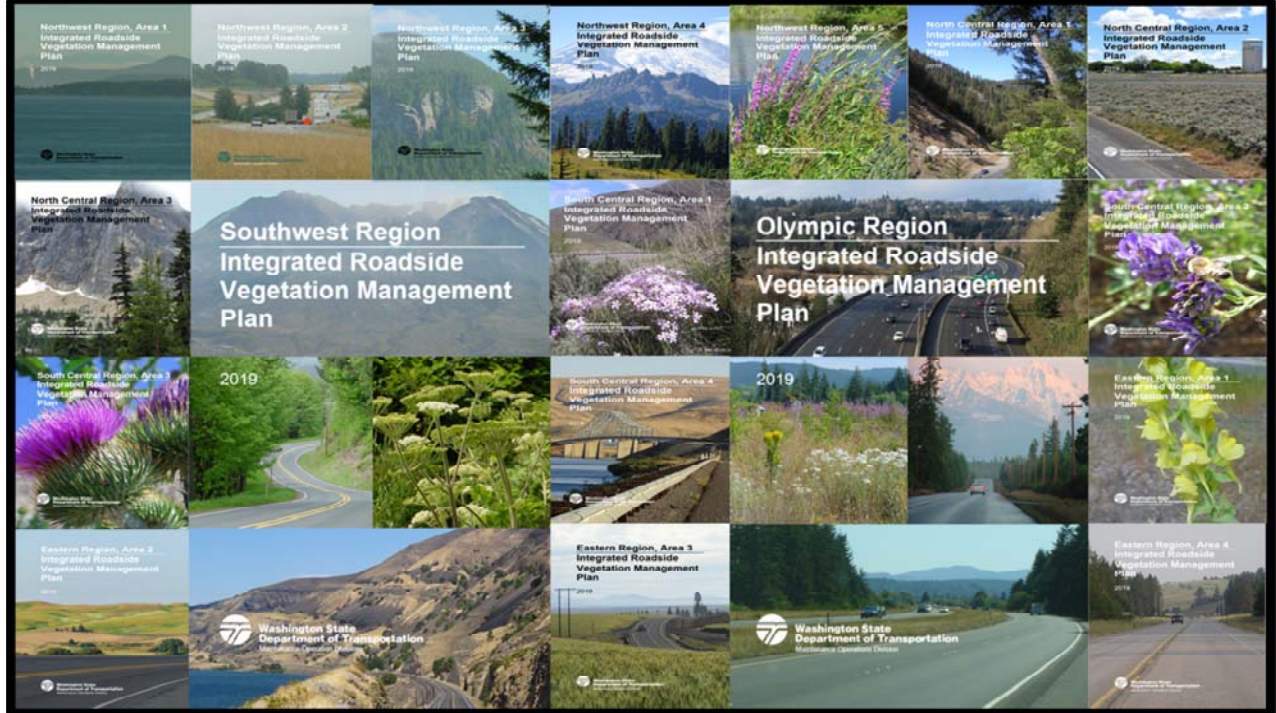
Roadside Weed Mowing											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108				
2016	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108				
2017	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108				
2018	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108				
5 Year Average	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108	\$10,108				

Roadside Weed Spraying											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2016	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2017	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2018	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
5 Year Average	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				

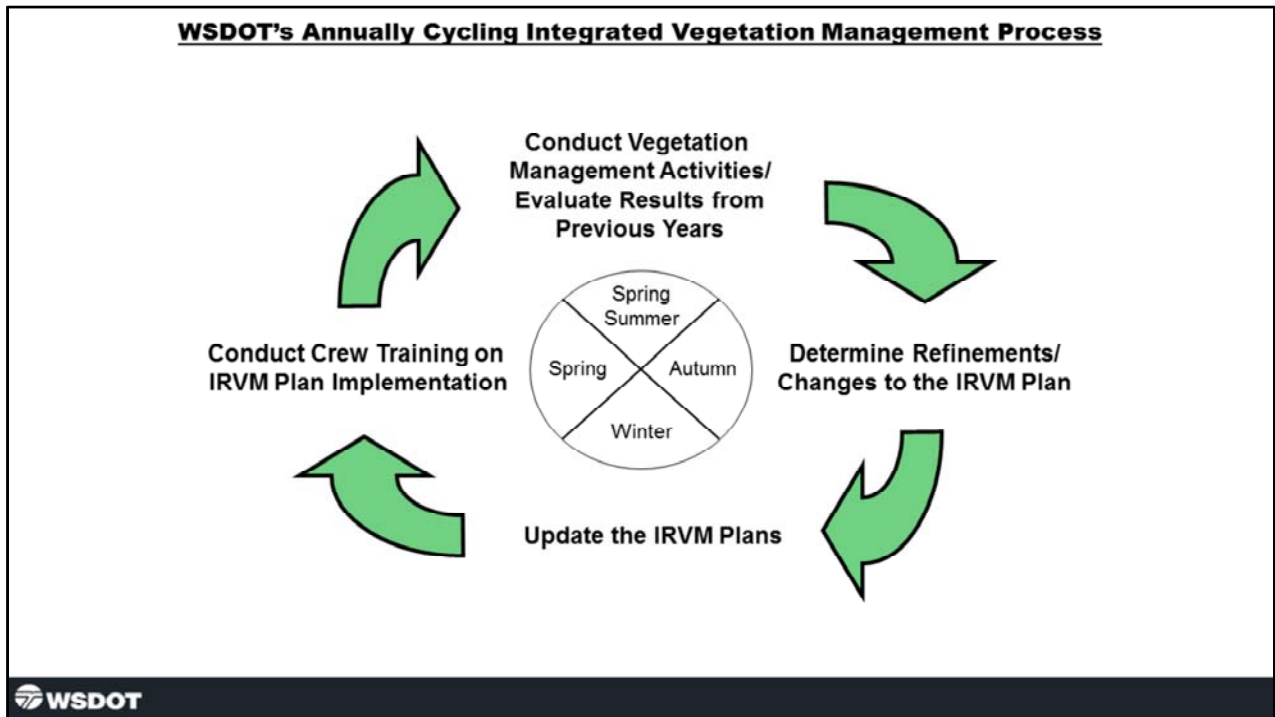
Landscaping											
Year	WV	NC	O	SW	SC	E	State	2015 vs. 5yr Avg	2016 vs. 5yr Avg	2017 vs. 5yr Avg	2018 vs. 5yr Avg
2015	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2016	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2017	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
2018	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				
5 Year Average	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111	\$1,111				

Speak to - what is at risk

- Invasive species
- Climate change
- More fire starts
- More people wanting to live in our state!



IRVM Plans and the annual process of discussing/refining tactics and training crews is the heart of our asset management process. WSDOT has been maintaining annually updated IRVM plans for all highways in the state for the past 15 years now... An integral part of the process is the engagement of the maintenance crews in the planning and technical aspects of vegetation management. These plans are also a key to engaging the public when questions arise around the condition of the system or our maintenance practices. Also, because these plans and the work generated each year are updated annually, they tell the story of each maintenance area's challenges and successes in managing their roadsides.




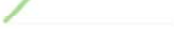







We should be looking for ways of making incremental improvements to our programs every year.

Multiple year/life cycle planning/management strategy, integrated the efficient use of all the tools in our toolbox.

Monitoring results and adjusting based on evaluation has to be part of this process.

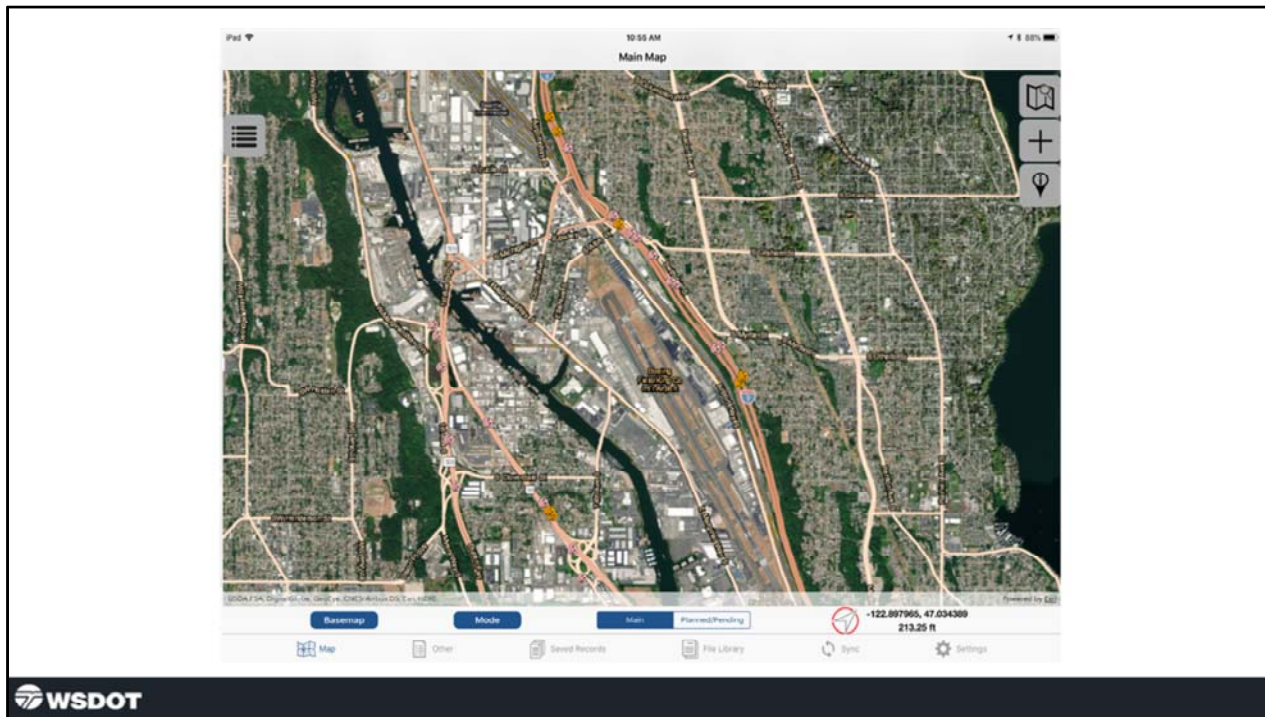
Limited resources, so: Carefully prioritized efforts are key, particularly in Zone 3 management of nuisance weeds (lowest priority IVM work)

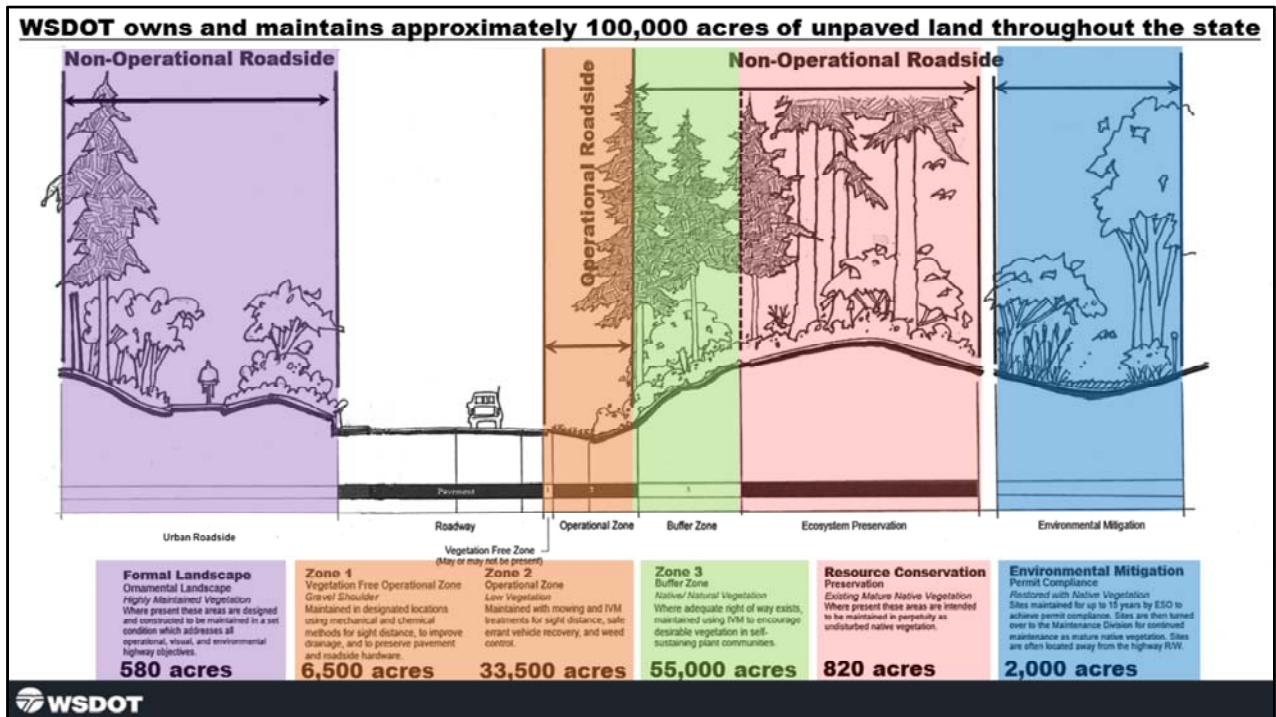
Planned vs. Actual Roadside Vegetation Management Activities = Performance Measurement

Roadside Vegetation Treatment Types	Geographic Inventory of Workload	Tracking Accomplishments
<p>Linear Edge Treatments</p> 	<p>Residual Herbicide Application</p> <p>Spray Zone 1 Reference</p>  <p>Edge Mowing</p> <p>Mowing Zone 2 Reference</p> 	<p>Acres Sprayed</p> <p>Acres Mowed</p>
<p>Spot Treatment for Noxious Weed Control</p> 	<p>Class A</p> <p>Noxious Weed Control Priority</p>  <p>EDRR</p> <p>Noxious Weed Planned Treatment</p>  <p>All other Noxious Weeds</p> <p>Noxious Weed Control General Reference</p> 	<p>Acres Sprayed and Acres Manual/Mechanical</p>
<p>Large Area Treatments</p> 	<p>Zone 3 Restoration</p> <p>Zone 3 Nuisance Reference</p>  <p>Formal Landscape Maintenance</p> <p>Landscape Maintenance Reference</p> 	<p>Acres Sprayed and Acres Manual/Mechanical</p> <p>Total Acres Maintained</p>



Walk through the GIS inventory features and units...

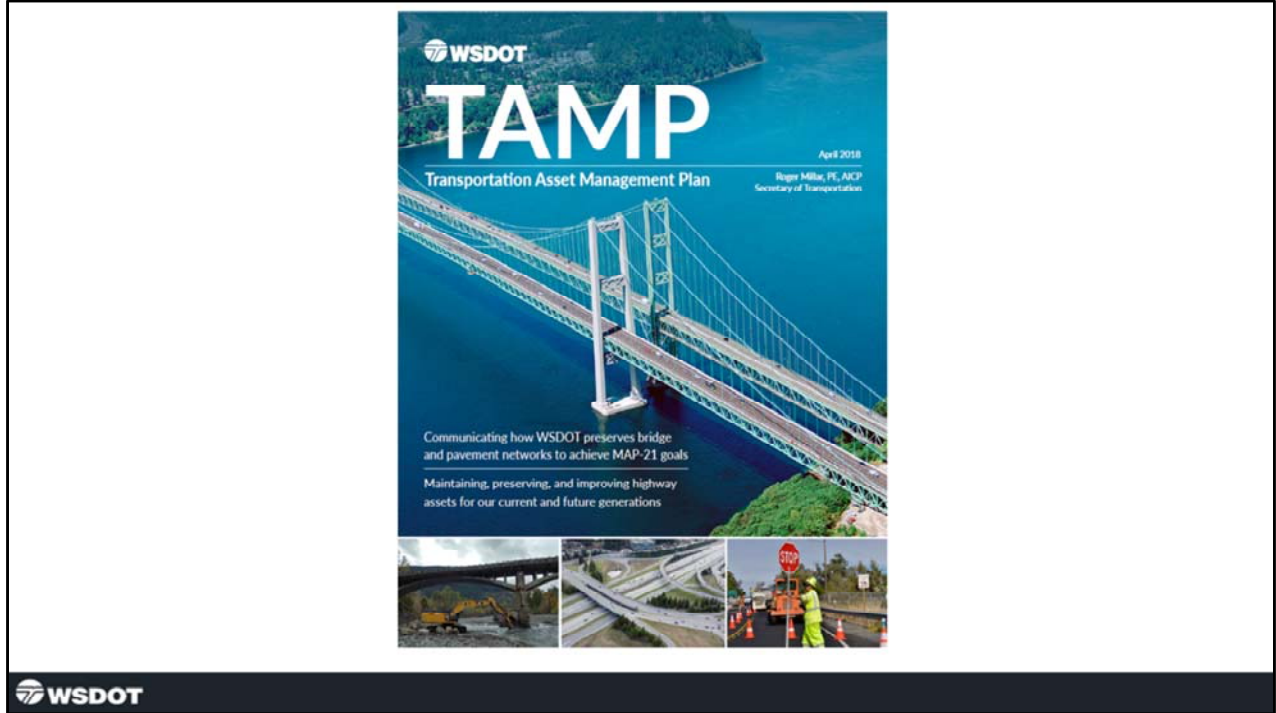




Explain what we have to work with statewide...

There are specific strategies and incredible detail in the management of each of these land use types, and if anyone is interested you can read through any of our IRVM Plans online. For the purposes of this presentation we'll explain the three major categories of Operational Zone (orange), the Vegetative Buffer Zone (green), and Environmental Mitigation (blue)

Life-cycle management strategies for each roadside land use type are customized and treatments are designed in response to the local ecosystems throughout the state.



It just so happens that all this work we've been doing to develop the roadside program is coming together as our agency leadership is studying the way each of the divisions accounts for the management of the transportation system assets. At this time information has been compiled in 20 asset management plans focusing on the various components of the highway transportation system. All this information together with what I'm showing here for the roadside land uses is still being discussed by WSDOT executive management with the intention of getting everyone on the same page internally before we go around saying how much more money we're going to need. But I can say in general terms, that the bottom line is – projected funding at the current levels is less than half the projected need for preservation and maintenance of the transportation system over the next 20 years.

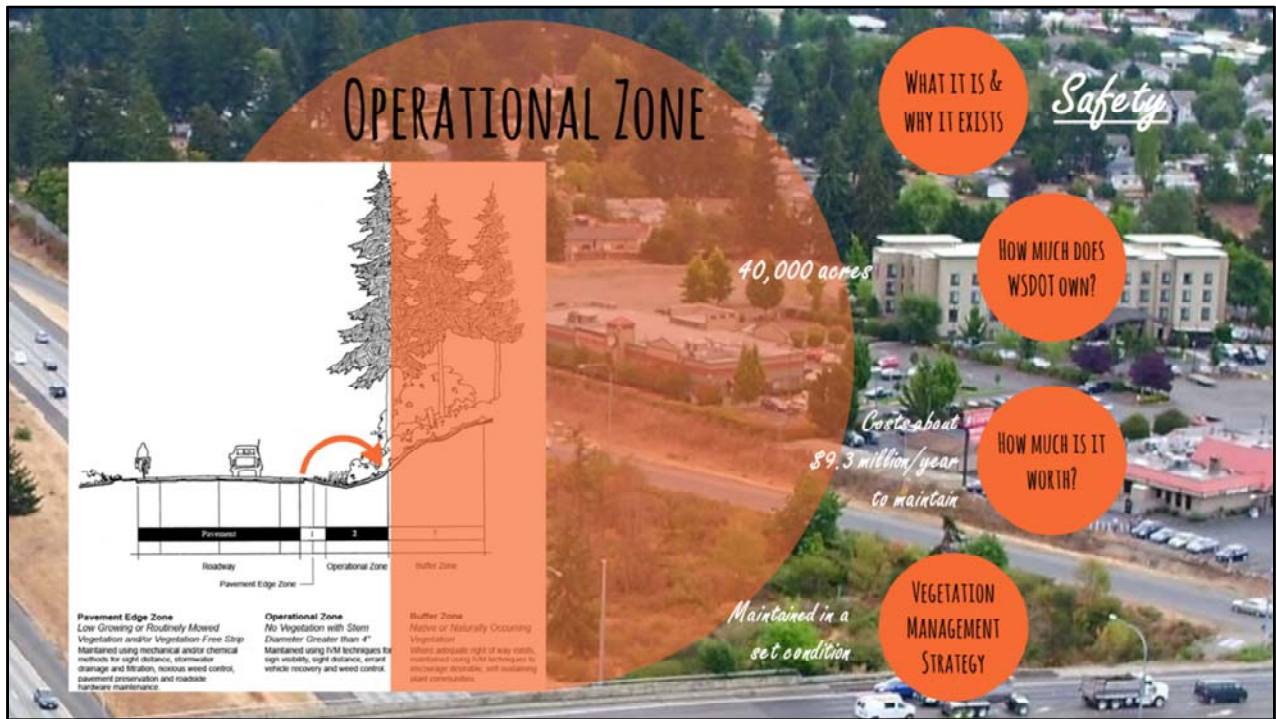


Talk about the overall current condition of our state roadsides...

The background to this slide is one example of where WSDOT has been successful in establishing a state of good repair in the roadside, at the lowest possible annual cost to maintenance. This would be one of most “practical solutions” for roadside management statewide. The interchange plantings were accomplished through the Adopt-a-Highway program around the turn of the century, there has been a successful (but still in progress,) effort to control Scotch broom (50+ year seed life), and the shoulders are paved in a way that facilitates stormwater drainage without maintenance of vegetation free gravel shoulder, and the established grasses do not require mowing. Providing we can continue to selectively remove any emerging vegetation that we don’t want on an annual basis, this section of I-5 through Lacey will continue to serve as an example of what we can achieve in a roadside, given the right attention.

This is what this presentation is really about – What can be done about this?. We cannot achieve sustainable roadside conditions throughout the state, given the current level of investment in highway maintenance, and in roadside maintenance specifically (much of the roadside work is lowest priority within highway maintenance), in fact an increasing amount of our roadside is being let grow wild for years, and condition is deteriorating in many locations.

What we have developed (are developing) in our RLU-AMP is a systematic breakdown of how the roadside is intended to function, and statewide geographic inventory of the treatments required to maintain the roadside in an “acceptable” condition (safe and in compliance with all laws). The basis for our functional analysis and planning for roadside land use are these five categories of highway right of way...



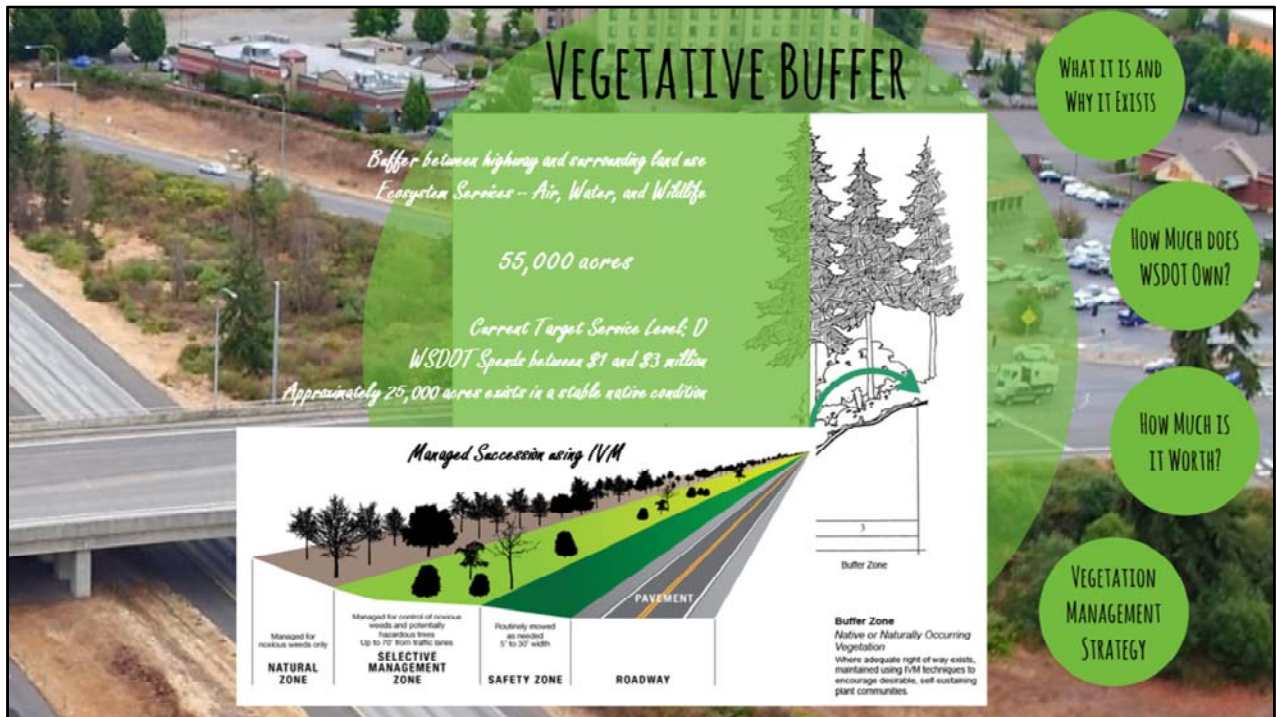
Briefly explain the first three circles...

Because vegetation in this zone has to be maintained in a low-growing condition, it requires routinely cycling maintenance actions of mowing and spraying. This work is easily predictable and fairly straight-forward to carry out, and because it's a liability if we don't maintain it, the condition of this part of the roadside is always maintained as close as possible to a state of good repair.



While this type of work requires some specialized knowledge in spraying, and in soil and plant biology, it is work the average maintenance employee can do as part of their overall highway maintenance responsibilities. This isn't the case with the other types of roadside land use we're managing...

Asset management in practical application
 Asset management results as a marketing tool



Along much of Washington’s highway system WSDOT owns land beyond what is needed for operational functions including the safety functions of the clear zone. It’s essentially a buffer between the highway and surrounding land uses, or between opposing lanes of traffic where there are wide medians, and on the interiors of freeway interchanges.

Historically, much of this buffer has been regularly mowed, primarily for aesthetic reasons. Today, mowing is mostly restricted to the 5-30 ft wide safety or clear zone. The roughly 55,000 acres outside the operational zones receives very little attention. The legislature has directed WSDOT to target management as a service level D which is a barely passing grade. Between 1 and 3 million dollars are spent on managing this zone each year, mainly dealing with hazard trees and noxious weeds.

The strategy for management of this roadside areas is quite different from what is required in the operational zone. In this area, we are trying to design and manage roadside vegetation so that it can continue to mature and improve in condition over the course of a 50 year + life-cycle. This is incredibly challenging within the realm of highway maintenance, where there are so many emergent issues we can’t even keep up with all the routine maintenance needs.



With regard to the overall set of roadside areas maintained by the agency, this area represents the largest (and increasing) gap between current condition and a state of good repair, and one of the major recommendations coming out of our RLU-AMP is a proposal for how the agency could address this gap.

WSDOT intends to seek funds to support staffing, within its Environmental sections, dedicated to establishing sustainable, self-perpetuating natural plant communities outside of the operational zones. Of the 55,000 acres in this category, an estimated 30,000 acres require control of invasive species, planting and other work to establish similarly self-sustaining plant communities. Our Integrated Vegetation Management Plans and HATS are designed to accomplish this and funding for implementation is the next important step.

The best way we have come up with to address the condition of our Non-operational/Zone 3 right of way is to treat it in the same way we have been treating our permitted Environmental Mitigation sites. That is with specialized, dedicated, vegetation management crews deployed throughout the state and a 10 year plan to restore 30,000 acres of out of control roadside.



WSDOT has considerable experience doing similar work in our environmental mitigation sites. These are permit-driven sites with legal requirements that drive our management. Once established and planted, it takes 10-12 years to attain the desirable native plant communities required by our permits. We have 2,000 acres of these lands. Those that have met their permit requirements become the responsibility of WSDOT’s maintenance program and, currently, \$4,600 are spent each year on their maintenance.



Establishing and nurturing native plant communities on our roadsides is a lot of work. However, if we work toward a goal of native self-sustaining plant communities in our highway buffer zones, we will eventually achieve a level of sustainability similar to what you might find in a park or national forest where the native plant community resists invasion by non-natives and requires very little maintenance. Our goal, if achieved, attains more ecological value in our roadsides, reduced maintenance costs, lowered use of fossil fuels and a reduced carbon footprint.