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Tapping Into a Powerful Tool

The ESL Calculator: Optimizing Both Pavements and Budgets

Roadsoft is a nationally recognized asset management resource because it provides state and local agencies with a robust set of tools for managing and making critical decisions regarding their infrastructures. Managing infrastructure on limited funds is a common concern for agencies. One solution for enabling fiscally sound pavement management decisions is the Extended Service Life (ESL) Calculator in Roadsoft. Funded by the Transportation Asset Management Council (TAMC), the ESL tool provides local agencies with one way for efficiently and cost effectively analyzing, calculating, and comparing differing Rehabilitation (Rehab) and Capital Preventative Maintenance (CPM) treatments for specific pavement segments in an agency's data set.

Asset management, or the process of maintaining, upgrading, and operating assets cost effectively, is important to agencies.

Many agencies are aware of the cost of different CPM treatments, but it is difficult to understand the value that each provides because historically, ESL calculation analysis only appears in theoretical studies. Theoretical calculations fail to address practical questions, such as "How long will a treatment last?", and "How well has a treatment performed historically for the agency's roads?", or "Which treatment would be the most cost effective?"

Agencies need a practical resource that helps maximize use of their limited funds. As a result, the development of the ESL Calculator by the Center for Technology & Training (CTT) began in 2013 with the support of the TAMC so that agencies can quickly perform an ESL analysis to help identify cost effective treatments.

The ESL Calculator quantifies the value added by specific treatments that an agency considers. Using the data from Roadsoft, an agency can compare the cost effectiveness, which helps to make efficient and informed asset management decisions.

What is the ESL Calculator?

The ESL Calculator is a data analysis tool that uses Pavement Surface Evaluation and Rating (PASER) data from historical ratings of an agency's road segments to calculate associated deterioration curves. The deterioration curves predict the value added (in years) by selecting CPM treatments, which are treatments that are designed to postpone age-related stresses. By quantifying the value of various CPM treatments, agencies can quickly compare the cost effectiveness of the potential CPM treatment options. It is possible to use the ESL Calculator to evaluate any treatment; however, it is most useful for evaluating CPM treatments.

The ESL Calculator effectively analyzes most Rehab or CPM treatments (e.g. Crack Seal, Microsurfacing, and overlays).

The tool enables agencies to evaluate data for multiple segments for a treatment and then drill-down to evaluate the data on individual segments. The ESL Calculator displays both a visual and table representation of the historical PASER ratings for a segment, along with an ESL rating. The ESL Calculator produces the Average ESL rating for the collection of segments. This calculated value can then help an agency determine which treatments extend the service life of road segments, and by how much. Combined with an agency's individual cost estimates for CPM treatments, the ESL calculations can contribute to a more accurate cost/benefit analysis of potential treatment options.

Use	TreatDate	FullName	Bmp	Emp	ESL
<input checked="" type="checkbox"/>	9/16/2016	Country Road 40	0.687	1.682	7
<input checked="" type="checkbox"/>	9/16/2016	Country Road 42	3.995	4.805	6
<input checked="" type="checkbox"/>	9/16/2016	Country Road 42	4.805	4.985	8
<input checked="" type="checkbox"/>	9/16/2016	Country Road 42	0.864	1.853	7

The ESL Calculator produces the Average ESL rating from the related deterioration curve.

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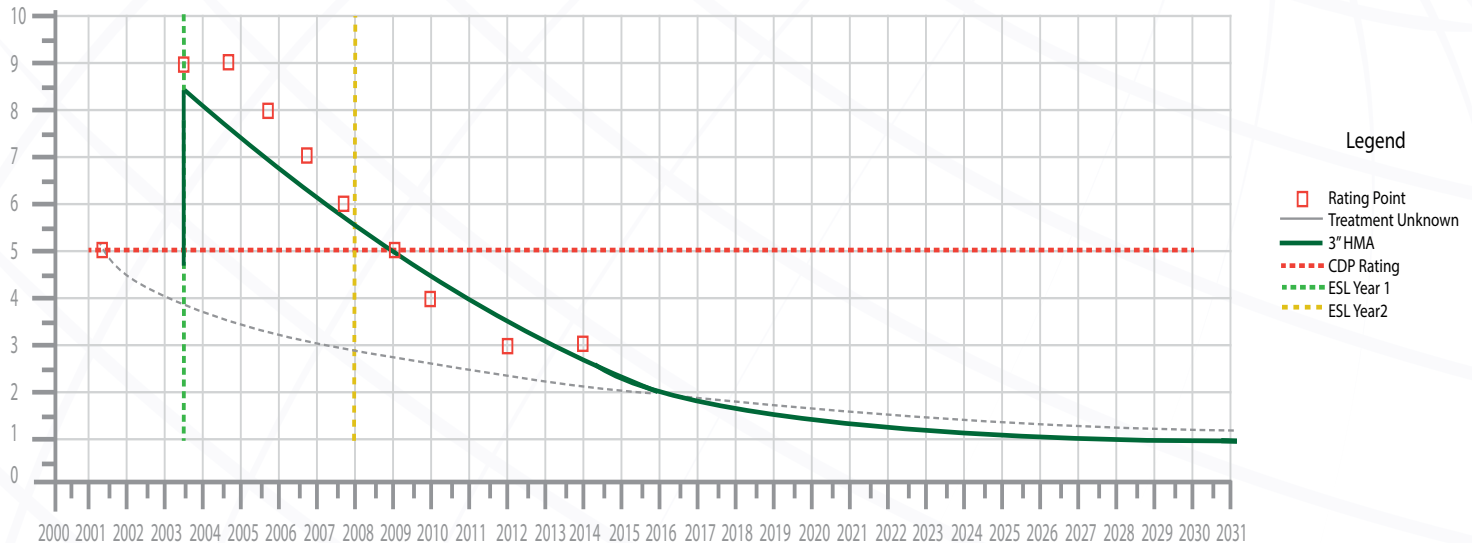
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ESL Gain

This graph shows a visual representation of the ESL Calculations. The gray curve demonstrates the state of the previous treatment, which had reached the red line representing the Critical Distress Point (CDP), meaning it required preventative maintenance. The green curve demonstrates the increased PASER rating and Extended Service Life (in years) that a CPM treatment added to a specific pavement segment, indicating that it adds about 5.5 years to the pavement's life before future maintenance is required.

How Do Agencies Benefit?

ESL Calculator feature is available in the current version of Roadsoft. The tool does not require any additional data entry, as long as there are historical PASER ratings before and after treatments entered in an agency's existing Roadsoft database. At a minimum, one historical rating needs to fall prior to the treatment and two need to fall after the treatment; however, the more ratings that are present in the calculation, the more successful the outcome. The quantified values that the ESL Calculator provides helps agencies optimize their strategies for asset management.

"Our agency has been using the ESL Calculator as a projection tool to better manage our assets."

- Rick Sprague, Transportation Planner

When agencies are able to combine the values from the ESL data with their own cost estimates for CPM treatments, they can use Roadsoft as a means for developing long-range management plans for their road networks. Rick Sprague, transportation planner, explains that the ESL Calculator helps Kent County Road Commission understand "how to best use the funds [they] are allocated" so that they can quantify the value of different treatments and optimize the agency's overall strategy. Sprague says: "Our agency has been using the ESL Calculator as a projection tool to better manage our assets." Asset management is a key benefit of Roadsoft, and the ESL Calculator helps Sprague and the officials at Kent County Road Commission focus resources on preserving existing roads, instead of totally rebuilding them.

Bay County Road Commission (BCRC) and St. Joseph County Road Commission (SJCRC) have also incorporated the ESL Calculator into their asset management policies. Like many agencies, funding is limited and the road network is deteriorating faster than they can make improvements. It is then important for local agencies to identify and tackle high-priority projects.

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Before the ESL Calculator, the BCRC tracked treatments and conditions in Roadsoft by extrapolating the data from just a few segments. Instead of applying the results from the sample set to the rest of their road network, the ESL Calculator now provides the BCRC with a specific projection for each road segment.

Cory Wale, BCRC assistant engineer, also highlights the necessity of optimization in their 2016 Asset Management Plan, "Our goal is to develop the best ratio of treatments to have the most positive impact on road conditions, regardless of what funding is allocated to us." The numbers crunched by the ESL Calculator helps the agency develop different models, and predict the impact on future surface rating projections. Ultimately, the ESL Calculator helps BCRC analyze the cost effectiveness of different treatments. The ESL Calculator is a resource for identifying long-range options that maximize the life of their road network.

"the ESL [Calculator] allowed us to view the effectiveness of that treatment over different surface types and rating values..."

-Don Preston, Engineer Technician

Whereas with the SJCRC, using the ESL calculator was a way to focus on the effectiveness of their standard treatment, chip seal. Don Preston, SJCRC engineer technician, describes their success using the tool, "the ESL [Calculator] allowed us to view the effectiveness of that treatment over different surface types and rating values, and it has opened our eyes on the effectiveness of past practices, as we plan for the future."

Ultimately, the ESL Calculator is one solution for some of the asset management challenges agencies face. By quantifying the value (in years) added by different treatment options, it enables agencies to make more fiscally sound asset management decisions. The ESL Calculator helps agencies manage valuable resources; furthermore, the use of the ESL Calculator does not require the collection of any additional data. Agencies already have the PASER data necessary for determining the ESL of treatments. Agencies like Kent County and Bay County have already seen the positive impact, the CTT encourages all agencies to explore the tool, or contact Roadsoft technical support today to learn more about the benefits of using the ESL Calculator.

Upcoming Events

REGISTER NOW!

2017 Roadsoft User Group Meeting

August 1, 2017
9:00 am - 11:00 am
Online

SAVE THE DATE!

2017 Intro to Roadsoft Hands-on-Training

October 31, 2017
8:00 am - 4:00 pm
Lansing, MI

SAVE THE DATE!

2017 RUCUS Roadsoft User Group Conference of the United States

November 1, 2017
8:00 am - 4:30 pm
Lansing, MI