

# Proposal to Build a Smart Scale Analysis Tool for Evaluating Prospective Projects

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## I. Introduction and Project Concept

The Virginia Smart Scale is a recently-adopted methodology to provide objective cost-benefit comparison of transportation projects competing for state funding. In order to better understand the likelihood that potential projects will gain funding, and to also understand how altering different project aspects will impact the likelihood of funding, we are proposing to build a Smart Scale project evaluation tool. This tool is envisioned as a password-protected web application which would allow users to enter or upload data on potential projects and then explore the resulting smart scale scores as well as the likelihood of gaining funding. The tool will furthermore support scenario analysis by allowing users to vary parameters and see the impact on Smart Scale scores and chances of obtaining funding. In order to estimate funding likelihoods, the tool will utilize historic data and corresponding results from earlier Smart Scale rounds.

## II. Project Scope & Key Capabilities

The following capabilities are envisioned for the software system:

1. *A Web-Based Tool:* The tool will exist as a web-based software application and will support password-protected user login to limit access to authorized users.
2. *Ability to Add Historic Smart Scale Data:* As more Smart Scale rounds occur, the new project data and results can be incorporated into the tool.
3. *Ability to Enter and/or Upload Prospective Project Data:* Users will have the ability to upload individual prospective projects and/or project sets for evaluation.
4. *Ability to Add/Modify Smart Scale Score Calculation Templates:* As the weighting of Smart Scale score factors and measurements can potentially change from one round to another, users will have the ability to create and modify score calculations via templates, ensuring that the tool can be used in future rounds.
5. *Ability to See Smart Scale Scores and Better Understand Funding Likelihood for Prospective Projects:* Users will be able to see the Smart Scale scores for prospective projects benchmarked against selected historical data. In addition, user-specified assumptions can also be incorporated. By comparing to historical Smart Scale funding results, this will allow the prospective of funding for each project under consideration to be understood.
6. *Ability to Explore Hypothetical Scenarios:* Users will be able to interactively vary parameters of projects under consideration and see the immediate impact on Smart Scale Scores and funding prospects. Users may also explore the impact of changing parameters in the historical data as well as restricting the historical data to specified subsets (for example: removing certain projects from historical data to see how it impacts prospective project funding likelihoods, or considering data only from specified Smart Scale rounds).

7. *Final Presentations:* Presentations will be made to the three FAMPO standing committees at the deployment completion.

### III. Software Development Timeline and Cost Estimate

The system as proposed is expected to take approximately 6 months to develop in total and will cost approximately \$69,000. A high-level approximate timeline is shown in the table below.

Project Component	Approximate Duration	Key Milestones or Deliverables	Expected Cost
Phase 1: Requirements	0.5 Months	1. Pre-development meeting to agree on project use cases, requirements, deployment environment, and engagement terms 2. Finalized project requirements	\$ 7,800.00
Phase 2: System Design	1 Month	High-level design complete	\$ 15,700.00
Phase 3: System Development	3 Months	Intermittent Design Sprint Reviews (4 – one approximately every 20 days)	\$ 31,400.00
Phase 4: Testing	1 Month	1. Acceptance Testing Complete 2. Finalized Software Code Base Complete	\$ 6,300.00
Phase 5: Deployment	0.5 Months	Deployment of System Into Live Environment	\$ 7,800.00
<b>DEVELOPMENT COST</b>	<b>6 Months</b>		<b>\$ 69,000.00</b>
Maintenance Plan	1 Year	Ongoing maintenance up to 40 hours per year	\$ 5,000.00
Cloud Hosting	1 Year	\$35 per month for 1 year	\$ 420.00
<b>TOTAL COST</b>	<b>18 Months</b>		<b>\$ 74,420.00</b>

A detailed proposed schedule can be found in any of the following three attachments:

- 1) Smart-Scale-Analysis-Tool-Project-Schedule.pdf: A PDF file containing the full GANTT chart
- 2) Smart-Scale- Analysis-Tool-Project-Schedule.xlsx: The detailed schedule in MS Excel format
- 3) Smart-Scale- Analysis-Tool-Project-Schedule.xml: An XML file able to be opened in MS Project

Finally, it should be stated that while the project is expected to evolve and periodically incorporate stakeholder feedback throughout the development process through the use of agile development methodology, the major contours of the project scope are outlined in section 2 above. Accordingly, any significant deviation from the overarching project scope as outlined in the six key capabilities listed above may result in changes to the project cost.

### IV. Deployment, Infrastructure, and Ongoing Maintenance & Support

The software will be developed within a modern web framework appropriate to the needs of the project (such as Django, Ruby on Rails, Shiny, or others). Accordingly, it can be deployed within one of FAMPO’s own servers or in a cloud environment such as Amazon Web Services (AWS) or Microsoft Azure. The cost of hosting the tool in a cloud environment will be approximately \$35 per month for service capable of handling approximately 100 simultaneous users; the costs will increase if there is a substantial uptick in the usage of the application.

Most software systems require periodic maintenance and occasional updating to remain fully functional as technology and business conditions change. Some support activities entail only minor updates to the underlying database software, while others may involve modifying or re-creating data in the database or even modifying

some of the software functionality. An annual maintenance plan to provide 40 hours of necessary ongoing maintenance and support (excluding functional modification) can be added for \$5,000 per year.

As a final note, because the proposed application will be owned by FAMPO (not UMW Center for Business Research), FAMPO will be responsible for providing a credit card number for any cloud hosting subscription plan selected. Monthly subscription fees will be charged against this account.