MEMO

TO: Jeremy Raw
FROM: Gabrielle Freeman; Jonathan Slason
CC: Beverly Bowen
DATE: April 29, 2022
SUBJECT: VE Pooled Funds: Task 2 Memo

1.0 TASK 2 SCOPING

The purpose of this memorandum is to inform the VisionEval (VE) Pooled Fund Task 2 by mapping the current state of VisionEval documentation, describing how the documentation supports different categories of users, and detailing how new documentation produced by Task 2 funds will be published within the current structure.

Previous documentation efforts[1] have identified the following audiences that are expected to use VE documentation in different ways.

- Decision-maker
- Semi-technical planner leading a project application
- Model applier (basic and super users)
- Contributors (developer, researcher, framework developer)

Table 1 attempts to map how different audiences might interact with the various VisionEval documentation resources at different stages of their learning.

TABLE 1. VISIONEVAL DOCUMENTATION BY USER TYPE AND LEARNING STAGE

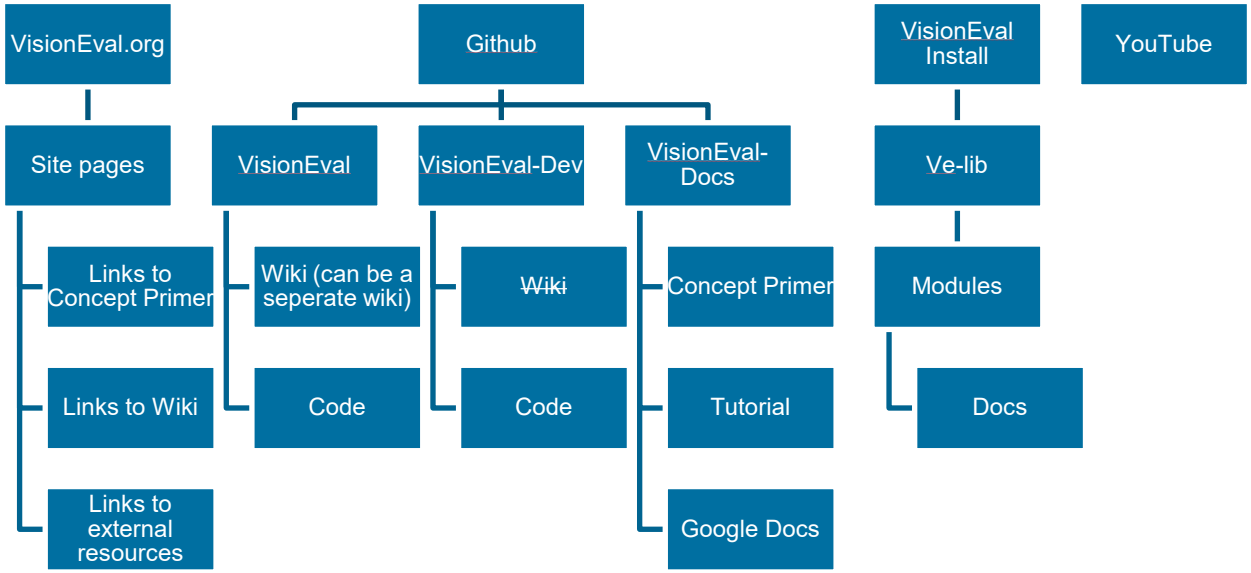
AUDIENCE	STARTING POINT / "FRONT DOOR"	LEARNING CURVE	DEEP DIVE
Decision-maker & Semi-technical planner	Web: VisionEval.org	Web: User Guide (VisionEval-Docs)	Web: User Guide (VisionEval-Docs)
Model applier	Web: User Guide (VisionEval-Docs)	Web: User Guide (VisionEval-Docs)	GitHub: VisionEval-Dev*
Contributor	Web: User Guide (VisionEval-Docs)	GitHub: VisionEval-Dev*	GitHub: VisionEval-Dev*

[1] https://github.com/VisionEval/VisionEval/wiki/Documentation-Plan
* Repo and scripts not Wiki

1.1 EXISTING VISIONEVAL DOCUMENTATION

There is a wide range of documentation out there on the VE tool, spread out through multiple locations. The number of locations make updates difficult. A clear organization structure would be particularly beneficial in addressing situations where documentation is no longer relevant, has been superseded by some technical changes, or has been written with one audience in mind but is being accessed by others. Figure 1 conceptually maps the locations and linkages within the current set of VE documentation.

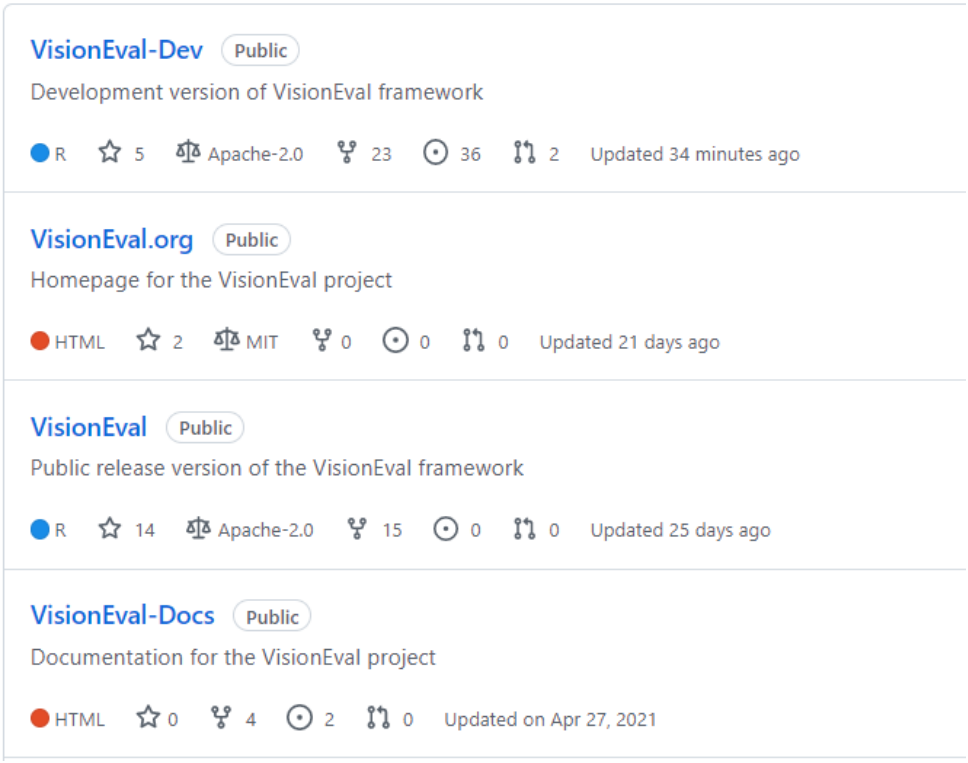
FIGURE 1. MAP OF EXISTING VISIONEVAL DOCUMENTATION



The VE Pooled Fund Study has an opportunity to re-think the organization of the documentation and work to start 'cleaning it' up with relevant and updated information. For example, documentation material could include a date and disclaimers as to whether this material has yet to be confirmed as accurate with the latest model.

Sources of documentation

VisionEval documentation, like the rest of the VE project, is supported on GitHub. The existing structure for VisionEval documentation is linked to four main repositories that serve different purposes:



Source: Github.com/VisionEval

VisionEval

The VisionEval repository houses the public release of VisionEval. The repository only has one master branch. There is a Wiki associated with the VisionEval repository that is one of the primary locations for model documentation. This repository, and the Wiki in particular, has a broad range of information (from documentation on core model concepts to details on model inputs) that supports all different categories of VE users, including both beginner and more advanced users. The Wiki has been set up to link to the markdown files that are hosted on the –Docs repository.

The Wiki is organized under three main headings: Getting Started, Software Management, and Review Committee. The Getting Started heading has most of the documentation information as it relates to user tutorials. Under the Getting Started heading are tutorial materials for VERPAT, VERSPM, and VE-State and well as training materials for VERSPM.

The tutorials for the VE-State and VERSPM located at https://github.com/VisionEval/VisionEval-Docs/tree/master/tutorials include an overview of the model and goes into detail module by module.

VisionEval-Dev

The VisionEval-Dev is the main repository for ongoing development of the VisionEval platform. This repository is more appropriate for developers and power-users who want to contribute code improvements. There are multiple branches, including the master branch which can be considered the beta release. The other development branches are where active code development happens and are used to test and evaluate new features and manage pull requests.

The Wiki under the –Dev repository needs to be reviewed as to what it includes compared to the main VE repository. For example, the RSPM tutorial in the –Dev repo currently directs to the main VE repository.

VisionEval.org

VisionEval.org is the project's website repository. The website serves as an initial landing spot for all users, as there are pages with information for users and for developers. The website contains overview details on the project and its background and has links to other VisionEval resources on GitHub.

VisionEval-Docs

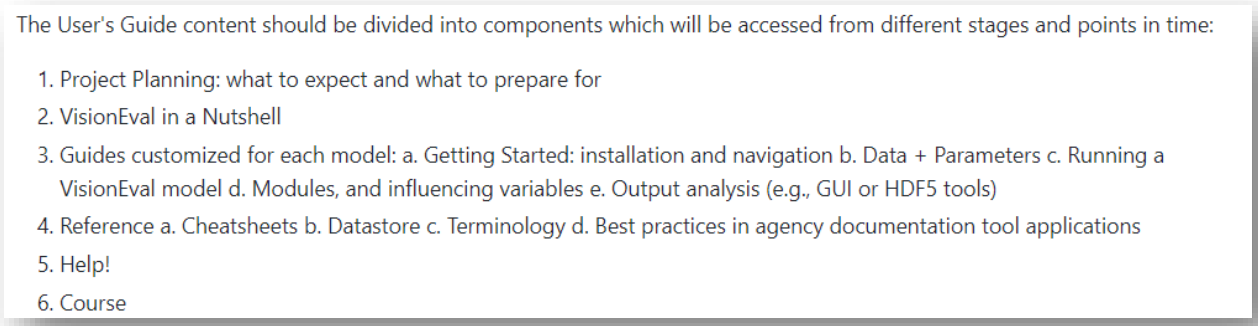
VisionEval-Docs serves as a main documentation repository. This repository hosts the **Concept Primer**, a resource for transportation planners that provides a high-level overview of the structure of the VisionEval system. The Concept Primer is intended for beginner users and was generated using Bookdown (https://bookdown.org/), making it a very user-friendly and readable document both in web and printed formats.

1.2 VERSPM & VE-STATE TUTORIAL AND REFERENCE

This section outlines the new documentation that will be produced within Task 2 and options for how to integrate them into the existing documentation structure.

The first new documentation that will be produced by Task 2 is the VERSPM & VE-State Tutorial and Reference. This tutorial is designed to guide the user as to the level of effort to be anticipated for collecting the needed inputs and describing the general approach for developing a base year and a future year model. The product is intended for beginner or even power users looking to apply VE models rather than developers. The tutorials are to be summarized in an updated version of the Getting-Started PDF that is included in the model package releases and downloads from VisionEval.org. The tutorial subtask will set out the headers and topics to be included in the tutorial.

The VE Documentation Plan on GitHub sets out a concept organization for the User Guide which is the first element of the tutorial:



The User's Guide content should be divided into components which will be accessed from different stages and points in time:

1. Project Planning: what to expect and what to prepare for
2. VisionEval in a Nutshell
3. Guides customized for each model: a. Getting Started: installation and navigation b. Data + Parameters c. Running a VisionEval model d. Modules, and influencing variables e. Output analysis (e.g., GUI or HDF5 tools)
4. Reference a. Cheatsheets b. Datastore c. Terminology d. Best practices in agency documentation tool applications
5. Help!
6. Course

Source: https://github.com/VisionEval/VisionEval/wiki/Documentation-Plan#2---user-oriented-documentation

The depth of content under each of the headers will be limited by the time and budget constraints of the task. However, this subtask will set the tone and the structure for future enhancements as well as contributions from the wider VE community.

Recommendation for hosting the documentation

The following describes RSG's primary recommendation on where to locate new tutorial materials based on user type. Alternative recommendations are also provided as well as some discussion on the pros and cons of different documentation locations.

Overall, RSG's recommendation is to continue to invest in documentation outside of the VisionEval Wiki. Resources like the Primer are becoming a more common interface for software applications and can be stood up from GitHub. A few examples include the Git-based websites for TMIP-EMAT[2] and ActivitySim[3] documentation and documentation for Conveyal[4] which is built using Docusaurus 2, a modern static website generator, and maintained on GitHub.

The VisionEval-Docs repository is the suggested location for developing documentation for Task 2. New documentation can be added onto the Primer and developed on the VisionEval-Docs repository as a stand-alone resource using a similar Bookdown format as the Primer.

Basic Users: VisionEval-Docs, add-on to Concepts Primer

The Concept Primer (visioneval.org/book) is the suggested location for a high-level overview on developing inputs, for example on how to decide on the analysis model years and level of effort.

This location should have a structure such as "Getting Started" and walk the user through the process of setting up the models and developing inputs. Links can be provided to specific module details, items to consider, etc.

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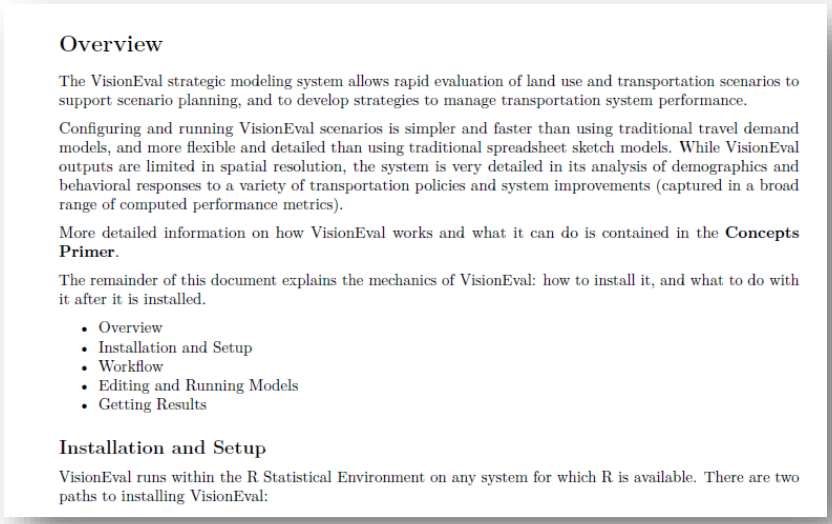
[2] https://tmip-emat.github.io/
[3] https://activitysim.github.io/activitysim/
[4] https://docs.conveyal.com/

A “Getting Started” guide will be packaged with the model install package similar to the Getting-Started PDF that is currently included by using Bookdown. The Bookdown format can produce PDFs as well as the web content.



Overview

The VisionEval strategic modeling system allows rapid evaluation of land use and transportation scenarios to support scenario planning, and to develop strategies to manage transportation system performance.

Configuring and running VisionEval scenarios is simpler and faster than using traditional travel demand models, and more flexible and detailed than using traditional spreadsheet sketch models. While VisionEval outputs are limited in spatial resolution, the system is very detailed in its analysis of demographics and behavioral responses to a variety of transportation policies and system improvements (captured in a broad range of computed performance metrics).

More detailed information on how VisionEval works and what it can do is contained in the **Concepts Primer**.

The remainder of this document explains the mechanics of VisionEval: how to install it, and what to do with it after it is installed.

- Overview
- Installation and Setup
- Workflow
- Editing and Running Models
- Getting Results

Installation and Setup

VisionEval runs within the R Statistical Environment on any system for which R is available. There are two paths to installing VisionEval:

Advanced Users: Stand-alone VisionEval-Docs Resource

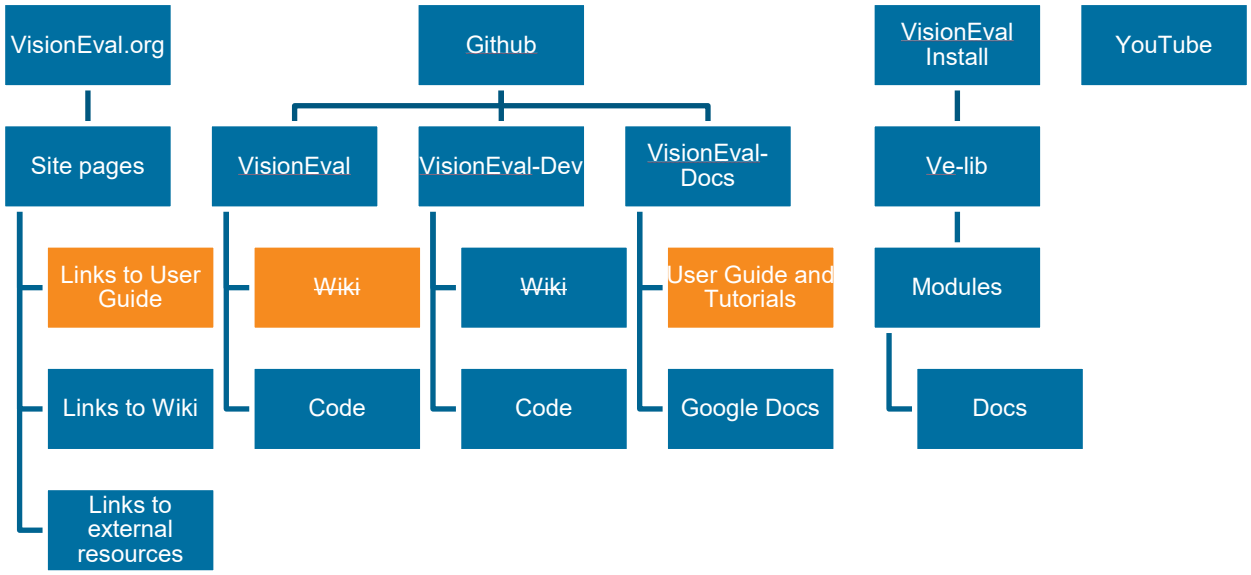
For more detailed information, an additional resource can be developed in a VisionEval-Docs repository targeted at a more advanced user and developer audience. This resource would incorporate information currently located on the wiki, include detailed information on inputs, and contain new information on the development and compilation of model inputs. This new resource would be developed in a Bookdown resource similar to the Primer source now.

Interim steps in developing this resource include:

1. Enhance the –Docs resources in Bookdown for new and advanced VE users
2. Shift material in the Wiki away from the Wiki format into the Bookdown format: the Wiki on the main VE repo would be archived and labeled clearly as such. ~~The Wiki on the Dev repository would be eliminated. [done]~~

Figure 2 depicts the recommended option structurally, with changes from the current VE documentation highlighted.

FIGURE 2. MAP OF RECOMMENDED CHANGES TO VE DOCUMENTATION



The “code” button includes the automatic production of the documentation when the package is built and then there is a part of that material that should be exported into the ‘docs – repo’. How to organize this material that is automated produced when these packages are updated. (see JR comments @12:21). Some manual vs. automated approaches using a workflow process (and benefit from Git hooks, etc.) Adding a documentation build process, however, is an aspirational feature and **will not be part of Task 2**.

Alternative Options

The alternative pathway would be to continue to add new documentation to and improve the VisionEval Wiki. The VisionEval Wiki already houses detailed information on inputs, their respective variables, and how they fit into the model structure. This information makes it a good location for additional input development information. The Wiki would be updated with the latest module information and confirm when inputs, bugs, when pull requests are accepted, or when the module has alternative versions (such as Multimodal, Driverless & AV, etc.).

Discussion

One potential downside to developing additional resources through VisionEval-Docs is having documentation spread across too many locations. The project team should make a strategic decision on whether to have separate documentation resources for beginners (i.e., Concept

Primer) and advanced users, or whether information should be consolidated into a universal User Guide for all audiences.

The recommendation to pivot away from the Wiki is based on the current state of practice from other open-source software tools. Additionally, although the Wiki already has a high volume of information, it can be difficult to navigate, especially for beginner users. There are also technically two Wiki pages, one associated with the public-release VisionEval repo and another with the VisionEval-Dev repo. The VisionEval-Dev Wiki appears to be more outdated with broken links, etc.

The Wiki currently serves as an important resource for more detailed model documentation, pertinent for more advanced users and developers. The project team will need to decide if it wants to continue to invest in and enhance the Wiki or if the contents of the Wiki should be shifted over to new formats. If the decision is to refine the Wiki, it is recommended that the VisionEval-Dev Wiki is removed as to not create more confusion on where documentation lives.

2.0 VISIONEVAL USER GUIDE

Following the scoping meeting on February 9, the project team agreed on developing the Task 2 documentation in a Bookdown format on the VisionEval-Docs repo. The team thought that all VE documentation can be compiled with separate chapters of a single Bookdown.

RSG has cloned the VisionEval-Docs repo and started the process of compiling the VisionEval User Guide. Within the Bookdown package, there are two distinct output formats: Gitbook and Bootstrap. The latest version of the VisionEval User Guide can be accessed at RSG's GitHub here: https://rsginc.github.io/VisionEval-Docs/

GITBOOK	BOOTSTRAP
• Collapsible headings • Clean style with built-in user adjustment of font, font size, and color • Built-in search	• Three column-style (sections on right) • More customization of colors/fonts (themes) • Built-in search

Following the March 8 project meeting, the project team agreed to use the Bootstrap format,

Table of Contents

Welcome

The Wecome page briefly introduces users to the VisionEval system and its purpose, copying key content from the VisionEval website. It also has a section on 'How to Use this Guide' that breaks down different audiences and suggests points of entry withing the User Guide.

Getting Started

The Getting Started section has technical details of how to install VisionEval and its dependencies.

Concept Primer

The Concept Primer copies the old Concept Primer Rmarkdown files and incorporates items into the User Guide. This section provides a non-technical overview of VisionEval applications and building blocks, as well as a lexicon describing key VE vocabulary (the lexicon can also be moved out of the Concept Primer and added to the

VisionEval Tutorial 101

This section contains basic introductory tutorial materials for VisionEval and a breakdown of the three separate models. It contains information from the Wiki as well as new content.

VERSPM Tutorial

This section has tutorial materials on VERSPM pulled from the Wiki. The main structure from the Wiki is retained, with sections on model Overview, Inputs and Parameters, Modules and Outputs, and Development and Installation. New input development content is being added to the **Modules and Outputs** section. This is the section where user inputs are described in more detail, and more information is being added to each input description on where data can be sources, key formatting considerations, tools to use, etc. Input development content is similar to that of the VERPAT model.

VERPAT Tutorial

This section has tutorial materials on VERPAT pulled from the Wiki.

VE-State Tutorial

This section has tutorial materials on VE-State pulled from the Wiki.

Developer Documentation

This section has information for contributors to the VisionEval System and pulls in Content from the Wiki

API Documentation

This section has module documentation from the source code.

Estimation in VisionEval

This section has information on how modules are estimated and tutorial information on how to customize packages.

Software Framework

This section has information on the VisionEval software framework and content is pulled from the VisionEval Model System Design and User Guide from the Wiki.[5]

2.1 TRANSFERRING THE WIKI

The User Guide will become the main location for documentation on the VisionEval project, a purpose that is currently being fulfilled by the Wiki. Building the User Guide entails moving content from the Wiki, however some of the content on the Wiki has become outdated. The project team has reviewed all of the pages and given them one of three "actions":

- **Archive** – Page is outdated and should be archived and not moved to the User Guide.
- **Use/Update** – Page content remains relevant and should be incorporated in the User Guide but needs to be updated or cleaned up to remove duplicate information. The parenthesis shows the section of the User Guide where content was moved.
- **Use** – Page content remains relevant and should be incorporated in the User Guide and needs little to no updating. The parenthesis shows the section of the User Guide where content was moved.
- **Wiki** - Page is still on the Wiki but not tagged as archived. Option to leave it on the Wiki or move to User Guide.

Table 2 includes all of the Wiki pages along with the action taken, date of last update, and relevant notes.

TABLE 2. WIKI CONTENT TAGS

WIKI PAGE	ACTION	LAST UPDATED	NOTES
Home	Wiki	1/2/2020	
alt definitions	Use/Update (Concept Primer)	6/24/2020	Integrate with Concept Primer lexicon, create Definitions page for User Guide
April 6 (management team)	Archive	4/6/2018	
Automated Testing	Use/Update (Developer Documentation)	9/18/2019	
Changelog for new versions	Use/Update (Developer Documentation)	6/11/2020	
Concepts Primer	Archive	8/9/2021	Material covered by bookdown Concepts Primer
Contribution Review Criteria	Use/Update (Developer Documentation)	10/1/2019	
Developer Orientation	Use/Update	3/4/2019	

[5] https://github.com/visioneval/VisionEval/blob/master/api/model_system_design.md

	(Developer Documentation)		
Development Roadmap	Wiki	9/17/2020	
Documentation Plan	Wiki	3/4/2019	This document is being used in the current documentation task, but does not need to be integrated in new User Guide
Draft Release Notes for 1.1	Archive	6/11/2020	
Early ideas for visualizer and GUI	Archive	1/2/2019	
Example Review	Archive	1/2/2019	
Getting Started	Use/Update (Getting Started)	1/2/2020	Combine into one Getting Started page
Getting Started v2	Use/Update (Getting Started)	2/4/2021	Combine into one Getting Started page
Goals and Objectives of VisionEval Model System	Archive	1/2/2019	Content included in other pages
Intel WiDi Case Study	Archive	7/13/2017	
January 12 meeting agenda	Archive	1/12/2018	
June 29 Team Meeting	Archive	6/29/2018	
May 18 Team Meeting	Archive	5/18/2018	
Meeting #1	Archive	8/24/2017	
Meeting #2	Archive	10/16/2017	
Meeting #3 Agenda	Archive	8/25/2017	
Meeting #3 Example Contribution	Archive	11/3/2017	
Meeting Notes	Archive	1/3/2019	
Modules and Packages	Archive	1/2/2019	
moreVE Local Policy Options UNDER CONSTRUCTION	Use/Update (VisionEval Tutorial 101)	9/13/2019	Good content on VE policies, can potentially be integrated into a larger section in User Guide
Multiple Scenarios	Wiki		
Project Meeting 2017.01.20	Archive		
Project Meeting 2017.02.03	Archive		
Project Meeting 2017.02.17	Archive		
Project Meeting 2017.03.02	Archive		
Project Meeting 2017.03.03	Archive		
Project Meeting 2017.03.24	Archive		

Project Meeting 2017.04.07	Archive
Project Meeting 2017.04.14	Archive
Project Meeting 2017.04.28	Archive
Project Meeting 2017.05.12	Archive
Project Meeting 2017.05.26	Archive
Project Meeting 2017.06.02	Archive
Project Meeting 2017.06.08	Archive
Project Meeting 2017.06.22	Archive
Project Meeting 2017.07.06	Archive
Project Meeting 2017.07.07	Archive
Project Meeting 2017.09.01	Archive
Project Meeting 2017.09.28	Archive
Project Meeting 2017.10.26	Archive
Project Meeting 2017.11.09	Archive
Project Meeting 2017.12.21	Archive
Project Meeting 2018.01.04	Archive
Project Meeting 2018.01.18	Archive
Project Meeting 2018.02.01	Archive
Project Meeting 2018.02.15	Archive
Project Meeting 2018.03.01	Archive
Project Meeting 2018.03.14	Archive
Project Meeting 2018.04.12	Archive
Project Meeting 2018.04.25	Archive
Project Meeting 2018.05.10	Archive
Project Meeting 2018.06.21	Archive
Project Meeting 2018.08.02	Archive
Project Meeting 2018.09.06	Archive

Project Meeting 2018.09.21	Archive		
Project Meeting 2018.10.03	Archive		
Project Meeting 2018.10.25	Archive		
Project Meeting 2018.11.15	Archive		
Project Meeting 2018.12.06	Archive		
Project Meeting 2018.12.14	Archive		
Project Meeting 2018.12.20	Archive		
Project Meeting 2019.01.03	Archive		
Repository Structure	Wiki	1/3/2022	
Review Team Charter	Wiki	1/2/2019	
RPAT features	Archive	1/2/2019	
RPAT to VERPAT	Archive	1/2/2019	
User Interface Design	Archive	1/2/2019	
VE Best Practices UNDER CONSTRUCTION	Use/Update (VisionEval Tutorial 101)	10/20/2020	
VE Definitions UNDER CONSTRUCTION	Use/Update (Concept Primer)	10/19/2020	Integrate with Concept Primer lexicon, create Definitions page for User Guide
VE Definitions2 UNDER CONSTRUCTION	Use/Update (Concept Primer)	4/23/2020	Integrate with Concept Primer lexicon, create Definitions page for User Guide
VE Inputs by Concept UNDER CONSTRUCTION	Use/Update (VisionEval Tutorial 101)	12/28/2020	
VE MultiModal Model Project	Wiki	3/10/2020	Create a section with variations of VE?
VE RSPM Tutorial	Use (VERPSM Tutorial)	7/8/2019	
VE State Development Approach	Wiki	3/31/2021	
VE State Development History	Wiki	3/31/2021	
VE State July Meeting	Archive	7/10/2018	
VE State Kickoff	Archive	6/4/2018	
VE User Experience	Archive	1/2/2019	
VE Validation UNDER CONSTRUCTION	Use/Update (VisionEval Tutorial 101)	7/6/2021	Use for validation content
VERPAT EV Module	Archive	1/2/2019	

VERPAT Inputs and Outputs	Use (VERPAT Tutorial)	1/2/2019	
VERPAT Inputs and Parameters	Use (VERPAT Tutorial)	1/8/2020	
VERPAT Modules and Outputs	Use (VERPAT Tutorial)	3/4/2019	
VERPAT Tutorial background	Archive	3/4/2019	
VERPAT Tutorial Model Description	Use (VERPAT Tutorial)	3/4/2019	
VERPAT Tutorial Model Description old	Archive	3/4/2019	
VERPAT Tutorial Model Description VisionEval	Archive	3/4/2019	
VERPAT Tutorial Multiple Scenarios	Use (VERPAT Tutorial)	1/2/2019	
VERPAT Tutorial Overview	Use (VERPAT Tutorial)	1/2/2019	
VERPAT Tutorial Performance Metrics	Use (VERPAT Tutorial)	3/4/2019	
VERPAT Tutorial Running the Model	Use/Update (VERPAT Tutorial)	1/2/2019	
VERPAT Tutorial Scenario Planning	Archive	1/2/2019	
VEState	Archive	1/2/2019	
VEState December Meeting	Archive	12/31/2018	
VEState October Meeting	Archive	11/4/2018	
VisionEval Models	Use (VisionEval Tutorial 101)	8/6/2020	
VisionEval Primer	Wiki	4/21/2021	
VisionEval responds to Bike Network Changes	Use/Update (VisionEval Tutorial 101)	2/28/2020	Case study section for User Guide?
Working Together	Wiki	1/15/2021	