GIS CAPABILITY MATURITY MODEL PEER EXCHANGE

Columbus, OH
September 19-20, 2017

Host agency:
Ohio Department of Transportation

Participating peer agencies:
Arkansas Department of Transportation
Iowa Department of Transportation
Oregon Department of Transportation
Tennessee Department of Transportation
Utah Department of Transportation
Urban and Regional Information Systems Association

U.S. Department of Transportation
Federal Highway Administration

TABLE OF CONTENTS

INTRODUCTION

Purpose

This report provides highlights from a peer exchange held in Columbus, Ohio, on September 19-20, 2017. The exchange was held as part of the Federal Highway Administration's (FHWA) Geographic Information Systems (GIS) in Transportation program and was hosted by the Ohio Department of Transportation (ODOT). The purpose of the exchange was for each State DOT to discuss their experience using Capability Maturity Models (CMM) and what their respective agencies would gain by completing a CMM. Having established this, the group then decided it was in all agencies' best interest to create a new CMM specific to State DOTs. This new version would evaluate an agency's ability to successfully accomplish defined tasks or a set of tasks related to GIS, the results of which can be used as a basis for measuring maturity over time and comparing capabilities among States. Using these metrics, FHWA can also better identify and provide assistance to State agencies in areas where they struggle to advance in terms of GIS capabilities.

Background

In 2009 the Urban and Regional Information Systems Association (URISA) developed a GIS-specific CMM that was first implemented as a self-assessment tool by Washington State DOT GIS operators. The results of those individuals and agencies who completed the CMM were discussed at URISA's Annual Conference in 2010, and CMMs were subsequently adopted as an official URISA initiative. In 2011, the first comprehensive pilot for the GIS CMM was carried out by Washington State DOT and Oregon State DOT GIS managers, alongside the development of an initial draft called the URISA Geospatial Management Competency Model (GMCM). This initial draft process was critical to making the connection between professional GIS management practices and the management of an enterprise GIS operation.

Through the evaluation of an agency's maturity with respect to GIS implementation, GIS managers and the executives who oversee the deployment of resources for GIS will be able to have meaningful, data-driven dialogues regarding the structure and characteristics of a mature, well-managed enterprise GIS system.

Format

FHWA's Office of Planning, Realty and Environment (HEP) sponsored the peer exchange. The Ohio Department of Transportation (ODOT) hosted the peer exchange in Columbus, OH. Participants included staff from ODOT and representatives from Arkansas Department of Transportation (ARDOT), Iowa Department of Transportation (IDOT), Oregon Department of Transportation (ODOT), Tennessee Department of Transportation (TDOT), and Utah Department of Transportation (UDOT). Allen Ibaugh, a representative of URISA, was also present.

The Peer Exchange was held over the course of two days. FHWA began the exchange by presenting an overview of the FHWA GIS in Transportation program and a summary of the previous GIS CMM Peer Exchange. This was followed by a discussion focusing on each agency's experience completing various versions of other CMMs, the strengths and weaknesses of the different models, and what each agency gained and failed to gain by completing them. The conversation naturally shifted toward a consensus that the best path forward would be to create a CMM specific to the needs and organizational structure of State DOTs. Due to the brevity and simplicity (two attributes of CMMs identified as valuable to State

DOTs) of a previously-discussed model, Slimgim, it was selected as the foundation from which to work to create the new model specific to State DOTs. The working group spent half of a day discussing what modifications would be needed to adapt the Slimgim model so that it would better meet the needs of State DOTs. The exchange concluded with a discussion of next steps and final remarks from FHWA that summarized the progress made during the Peer Exchange.

Overview

In early 2017, FHWA reached out to six States to pilot the URISA GIS CMM following the previous year's peer exchange. Of the six, four States participated in a follow-up interview for a case study report. Of those States, representatives from the Iowa, Ohio, and Tennessee DOTs were present at the September, 2017 peer exchange and offered an open and honest discussion about their experience with the pilot CMM which is summarized in Table 1 (below).

Agency Name	Feedback
Iowa Department of Transportation	IDOT felt the URISA CMM was tailored more towards local government rather than a State agency. The URISA model is focused more narrowly on GIS data rather than the overall system and would like to see it brought to a higher level. They would also like to see the model simplified because the URISA model was complex and tedious to go through. The model also failed to incorporate transportation specific components. When actually going through the CMM, those responsible for completing the assessment got hung up on deciding what scores to assign.
Ohio Department of Transportation	ODOT believe the URISA CMM was too focused and should be brought to a higher level. ODOT would also like to see the scoring system more defined so less time is spent deciding how to score each criteria.
Tennessee Department of Transportation	TDOT brought in many colleagues from different departments to collectively complete the assessment and believes more buy-in will occur if more people are involved. The structure of the URISA CMM was not suitable for a complex organization and should be designed to accommodate a broad range of organizational structures. TDOT would also like to see more emphasis on State specific challenges.

Table 1: Summary of feedback regarding the pilot CMM

Participants followed up on the discussion of their past experience with the URISA CMM by discussing how a CMM is best suited to meet the needs of a State DOT GIS Division.

CMM For State DOTs

Purpose

The purpose of the CMM is two-fold: 1) to provide State DOTs with a resource to assess themselves in terms of efficient use of geospatial systems and how well they are meeting the goals and mission of the agency and 2) to use those results to compare themselves to their peer agencies to create a baseline measure of their maturity using geospatial systems, assess where they need to improve, and help identify agencies with a greater level of maturity in a certain area allowing them to share their best practices.

Goal

The goal of the CMM is to communicate performance metrics related to GIS capabilities with upper management within the State DOT and other agencies. The CMM should help an agency assess where they need improvement and thus should focus resources in those areas. The CMM should also be standardized in a way that allows for comparison across State DOTs and across time.

Slimgim

IDOT has been using the Slimgim CMM for about 6 years to assess the agency's organizational maturity at a high level. Slimgim measures the areas of successes and failures of Enterprise GIS within an organization and provides near instantaneous feedback. The Slimgim model is similar to URISA's CMM in that it breaks down the assessment into categories. Like the URISA model, users input a score between 1 and 5 for each criteria based on their perceived maturity. Slimgim is unique in that it requests users to assign 2 scores per criteria: the level of maturity and the likelihood of improvement. Both of these ratings are used to calculate the overall categorical score. According to IDOT, the Slimgim model is very user friendly because the assessment is completed using excel and the summary report is automatically generated and easy to interpret.

Upon reviewing the Slimgim model, the participants collectively decided to use it as a starting point for the creation of a CMM specific for State DOTs. In reworking the Slimgim model to fit the needs of State DOTs, the participants first narrowed down 5 categories. The first category, Organizational Structure and Leadership, aims to assess the maturity of the organization's upper level management. The Corporate Culture category evaluates the organization's practices in regards to GIS. The Organizational Capability category gauges the staff's ability to utilize GIS programs to meet project needs. The goal of the Enterprise GIS Sustainability category is to ensure the GIS enterprise has continual financial support. The fifth category, Foundational Data and Technologies, evaluates the organization's data maintenance practices. The participants then went through each of the criteria and selected those that appropriately assess the categories. Once the criteria were selected the participants made necessary rewording so they addressed State DOTs specifically.

NEXT STEPS

Moving forward, the participants will reconvene via phone conference to finalize the model. Upon completion of the CMM, an estimated 10 State DOTs will be asked to pilot the CMM. Peer exchange participants will host a follow-up discussion with pilot States to assess where improvements should be made in the CMM. After making any necessary improvements to the model, the peer exchange participants will present the final CMM at a roundtable discussion at the next GIS-T Symposium in Little Rock, AR in March of 2018.