Quality Matters
Vol. IV, Issue 2 – Summer 2014
from the Quality Assurance Branch (QAB) of Highway Design

Kentucky Utilities and Rail Tracking System

Sharing Data for Better Project Management

The Division of Right of Way and Utilities has recently unveiled their honorary award winning web-enabled program known as Kentucky Utilities and Rail Tracking (KURT) system. The program allows access from anywhere with Internet providing a streamlined experience for approval of agreements, invoices, viewing utility relocation change orders, and project status changes. Recently, the program received Honorable Mention at the 2014 Excellence Awards for Innovation, presented by the Federal Highway Administration. This award is intended to reward "the ability to incorporate new technologies or processes to enhance utility projects, or an organizations' utility coordination program."

KURT system improves the approval process for new Kentucky Transportation Cabinet project utility relocations by reducing the overall amount of time each document spends in transit, reduces chances of getting misplaced, and provides real time information about where any given document is along the path to approval.

It is easy to imagine the possible delays a paper document can encounter from destination to destination. For example, agreements are drafted at the District Office, are sent to the utility company, and then returned by the utility company to Central Office for processing. With the advent of the KURT system, documents can be associated with a particular project. A utility company is able to upload an invoice and associate it to a viable agreement. That invoice will be immediately available for the approver to review. The document shows up immediately in a list showing items awaiting action from the approver. A few clicks later and it has moved a step closer to approval.

Tabs within the KURT system help the user navigate available utility information starting with Project Status, Planning, Initiation, Coordination,Agreements/Approvals,

Construction, and ending with Closeout. Each user has access based on their contribution to the process. Utility company users will only see projects that require relocation of their utilities while a KYTC employee will have access to all projects in a given District or across the State.

Others may receive "read only" access, upon request from the Central Office Division of Right of Way and Utilities. This access allows review of most documents associated with the project including the utility plans, utility relocation status, and the ability to download critical utility impact data via a utility conflict matrix for each project.

KURT system also offers a convenient way to look up utility companies that operate in each county with contact information for each.

This program was released March 2014 and is expected to be in full use by 2015, at which time access will be provided to requesting utility companies. Those interested in "read only" access, basic training, or KURT user manuals can contact Jennifer McCleve, the Branch Manager of the Utility and Rail Branch and KURT system administrator by e-mail: Jennifer.McCleve@ky.gov.

by Shawn Russell, PE

What to do about the Bump at the End of the Bridge?

KYTC and the Kentucky Transportation Center has begun a research project titled, "Bridge End Settlement Evaluation and Prediction." Ever since the first bridges were built, bridge end settlement has been a problem. Over the years there have been several studies and many different concepts developed and implemented in an effort to eliminate or, at the least, minimize the bridge end settlement problem.

This study was initiated by the Quality Assurance Branch after receiving feedback from KYTC staff statewide. Some of the concepts developed show promise, but no solution works in every situation. So, what else can we do to handle this problem? Simply put, we need to find a way to predict how much settlement can be expected at any specific bridge over the life of the facility.

From there, a plan of action for repairing the settlement at the most opportune time can be developed that will minimize the lifecycle cost. So how do we get there? Over the next 3 year period, this research project will collect and analyze design, construction, and maintenance data from a range of road and bridge projects all across Kentucky. Elements such as design, geologic condition, geographic region, and other project specific characteristics will be analyzed to develop a predictive model for bridge end settlement. Guidance will be developed for choosing the appropriate remediation methods for a specific location based on the predicted settlement of the model. Look for future articles concerning this topic as this research project progresses.

by Michael Vaughn, PE, AVS

Do you have what it takes to be a constructability reviewer?

We're looking for some good men or women to join our crew! We need two new engineers or techs to conduct constructability reviews of projects. These reviewers provide a valuable service to Project Development Teams and to PD & P crews. Each position will be "interim" meaning it is a nine-month on/three-month off term, perfect for a retiree looking to continue work but at a lower intensity. We need someone with construction experience and ideally some design experience too. So far, we've been fortunate to hire retirees that have been able to work out of the closest District office to their home.

We need someone with a strong construction background interested in improving the design process. They will use their experience to help identify constructability issues on projects prior to letting. Reviewers will use their knowledge from past projects to improve the quality of projects statewide. If you know someone interested in this kind of challenge or want to learn more, contact Brent Sweger at 502-782-4912 or by e-mail: Brent.Sweger@ky.gov.

Upcoming Training:

Kentucky Engineering Center:

(http://www.kyengcenter.org/)

MicroStation I for Civil Professionals
August 12-Frankfort

Water and Wastewater Infrastructure Seminar
August 13-Lexington

2014 ACEC-KY/FHWA/KYTC Partnering Conference
September 08-Louisville

Somerset One Day Fall Seminar
September 17-Somerset

Highway Capacity Analysis using HCM 2010 and HCS 2010
September 30-Frankfort

Bowling Green One Day Fall Seminar
October 03-Bowling Green

InRoads II
October 14-Frankfort

Prestonsburg One Day Fall Seminar
October 21-Prestonsburg

Paducah One Day Fall Seminar
November 12-Paducah

Applying InRoads (V8i) III
November 18-Frankfort

Fall Dendrology & Native Tree Identification
December 04-Clermont

MicroStation II
December 09-Frankfort

Research Report Spotlight

TOOLS FOR APPLYING CONSTRUCTABILITY CONCEPTS TO PROJECT DEVELOPMENT (DESIGN)

The Kentucky Transportation Center has completed a study of the KYTC's constructability review process and data. This study has also been featured in the Transportation Research Board Newsletter and can be found on KTC's website at http://www.ktc.uky.edu/files/2013/11/KTC_13_15_FRT_190_11_1F_.pdf. Included here are the recommendations from this study:

• Perform constructability reviews early in design during the preliminary design phase to continually keep a focus on constructability issues.

• Rather than using a single expert to conduct a review, introduce Constructability Review Teams to the review process consisting of a facilitator, project manager, and two experts in construction. As project size increases traffic operations and Right of Ways engineers could also be included to add valuable input. Similar to Value Engineering, this allows experts with different perspectives to identify areas for potential improvement.

• Utilize constructability review comments to monitor the frequency of constructability issues by District. Then implement training workshops to address those reoccurring issues.

• The constructability review database consists of a collection of more than 6000 comments. These comments cover a range of topics such as Phasing, MOT, Earthwork, or Permanent Drainage. In a database format it is searchable potentially allowing KYTC Districts, Central Office, and consultant personnel to review. Sharing this database with others will allow others to identify common issues that may have gone unnoticed on their plans.

• Expanding constructability reviews to all projects can decrease the cost of building future projects. This report indicates a minimum 1.25 % savings can be expected from a constructability review; however, the savings have been much greater on individual projects. Sometimes the amount of savings received from finding constructability issues early in the design process is difficult to determine. The Kentucky Transportation Center offers to delve deeper into the data to create models that will "allow for the prediction of benefits and possibly permit a prioritization of projects to be reviewed."

FAREWELL

Mike Vaughn was in the Quality Assurance Branch for a short time serving as the VE Coordinator. During his time here he coordinated a Value Methodology Training Workshop (Module I) and set up two Value Engineering Studies. Vaughn was also very helpful contributing articles for the Quality Matters newsletter. He has transferred to the Division of Highway Traffic to become a Highway Safety Improvement Program Coordinator for a portion of the state. If you would like to contact him, his email remains the same:
Mike.Vaughn@ky.gov

FAREWELL

Eileen Vaughan was in the Quality Assurance Branch for a short time. She left her stamp on QAB by applying her knowledge of databases to the Post-Construction Review and Lessons Learned Database. She also enhanced this branch greatly by being able to analyze information collected to determine trends and stats over time and by geographic location. If you would like to contact her, her e-mail remains the same:
Eileen.Vaughan@ky.gov

WELCOME BACK

Brent Sweger returns to Quality Assurance as Branch Manager after working as the Location Engineer of Districts 4 & 11 in Highway Design. He is excited about the potential for this Branch to add value to the design process by analyzing what recurring issues impact Project Delivery most and offering alternative solutions. Sweger looks forward to sharing these issues and solutions with Designers to improve constructability on projects after letting. If you would like to contact him, email:
Brent.Sweger@ky.gov

Lessons Learned

Constructability: What Can We Improve?

Constructability Reviewers in the Quality Assurance Branch of Highway Design were asked to provide a list of the most common comments they include on their Constructability Review Reports.

Extra time spent on maintenance of traffic (MOT) plans will make your project significantly more constructable. MOT plans that are too general can leave KYTC construction personnel with the burden of making it work. Many of our construction contractors on KYTC projects have a lot of traffic control experience and have the ability to see what needs to happen. However, KYTC assumes some risk when MOT plans fail to illustrate clearly how to maintain traffic while building the project. For example, when MOT plans for a temporary diversion paid as a lump sum fail to clearly illustrate how the diversion should be constructed, we can end up with less than desirable slopes, the need for guardrail, find water trapped between the diversion and existing roadway, or abrupt changes in the vertical or horizontal alignment. Making these matters worse, an undesirable diversion that was intended to only be in place for a month or so may need to remain in place over the winter if the project suffers foreseeable delays.

Traffic switches on the project are one of the most stressful moments during construction. Taking the guess work out of the MOT plans will help greatly to take burden off our KYTC employees, aid construction contractors, and reduce the assumed legal liability.

Here are some key MOT issues for designers to consider:

- Avoid overuse of part-width construction. Make sure if using part-width construction that there is adequate width to do so. For example, it can be very difficult to construct full depth pavement using part width construction to tie new roadway to existing roadway while maintaining traffic. Consider limiting traffic to one lane for the duration of the work utilizing flaggers or temporary signals for lower volume roads. When part width construction is possible, include a cross section.

- Include temporary diversions and widening as needed to provide acceptable traffic control within the limits of the project. Cross-sections are a valuable tool to help verify the width needed is available and clarify a multitude of information including lane widths, center line of proposed diversion, and at a glance if slopes will require guardrail. Include details about temporary pipe needed for diversions or widening on maintenance of traffic sheets to ensure the correct size pipe is defined. Supplemental Specifications 112.03.12 to the Standard Specifications for Road and Bridge Construction, 2012 Edition indicates when pipe size is not indicated, work will be handled as force account work instead of being included with the bid item for diversions.

- Anticipate drainage on maintenance of traffic plans including how to handle temporary drainage and how to construct permanent drainage.

- Check quantity of bid items. Verify quantity of stone for maintenance of traffic purposes includes enough for temporary wedging, temporary widening, and entrance construction. Also check quantity of temporary pavement markings. Anticipate the potential need for additional pavement markings between phases or the need for additional paint if one phase will be in place for a long time, especially if that phase might extend through the winter months.

by Shawn Russell

LESSONS LEARNED Database Available Online:

http://transportation.ky.gov/Highway-Design/Pages/Lessons-Learned.aspx

Staff

Brent Sweger, PE, AVS
Quality Assurance Branch Manager
Brent.Sweger@ky.gov
(502) 782-4912

Shawn Russell, PE, AVS
Program Coordinator
Shawn.Russell@ky.gov
(502) 782-4916

Vacant
Program Coordinator
"To be advertised as Transportation Engineering Specialist"

Vacant
Lessons Learned Coordinator

Shannon Martin
Kentucky Design & Print Services
Graphic Designer Coordinator
ShannonL.Martin@ky.gov
502-782-4718