Quality Matters
Vol. II, Issue 3 – Fall 2012
from the Quality Assurance Branch (QAB) of Highway Design

An alternative approach to Access Management

Access management (AM) is often discussed during the project development process. However, each designer tends to have a different definition of what it means. This article will clarify what AM is and help lay out a strategy to effectively apply the concepts into the projects you plan or design.

A common misconception is that AM only involves the spacing of driveways along a roadway. In reality, it is much more complex and comprehensive. AM is commonly defined as the systematic control of the location, spacing, design and operation of:

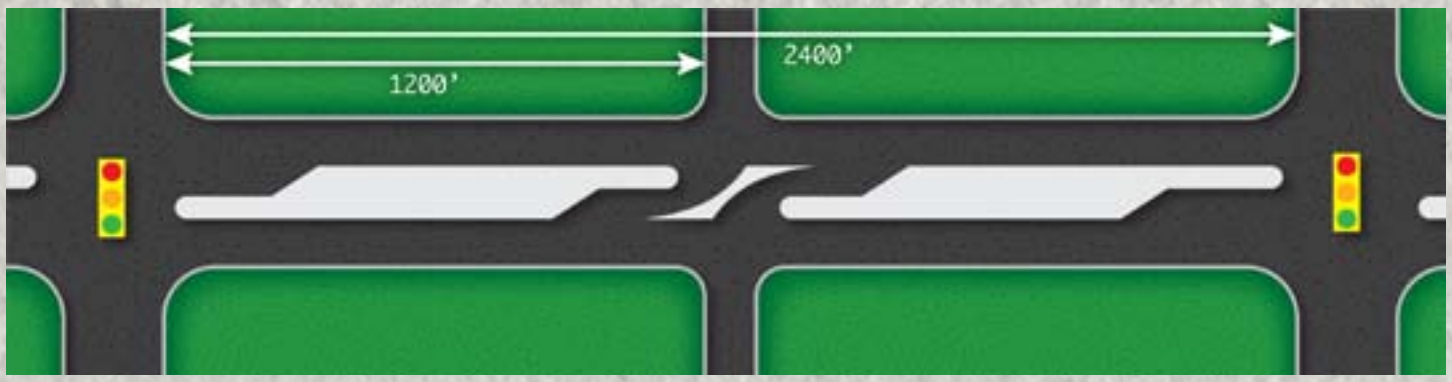
- Driveways
- Median type and openings
- Interchanges
- Street connections
- Traffic signals

The elements of design listed above have a direct and profound impact on the safety and operation of traffic on our roads. This is true for urban, suburban and rural locations. Ultimately, each driveway and street connection along a highway introduces a number of conflict points. The denser the conflict points, the higher the number and severity of crashes. The quality of traffic flow also diminishes.

The goal on every project should be to minimize and separate the number of conflicts. This can be done using many techniques that will be discussed in a future article. The reason for the misunderstanding and misapplication of AM in design is that Kentucky's regulation only addresses the spacing of driveways and only on roads classified as partially-controlled (PC) access. The other at-grade classification, By Permit (BP), doesn't address driveway spacing and location beyond the requirement of sight distance. The current practice has been to buy access rights, at all costs, to meet the driveway spacing needs for PC roadways. On BP roadways, the practice is to put back the previous driveway configurations. In both cases, we may not have received the best AM value.

In 2008, under contract to KYTC, the Kentucky Transportation Center (KTC) developed a proposed classification system and associated AM guidelines. The classification system designated roads based on their functional classification, volume and speed limit. A Class I roadway typically moves large volumes of cars long distances with little interference. A Class IV roadway is meant for lower volumes, primarily for access to adjacent property. There are guidelines for each classification that address all of the bulleted design elements listed. They were based on safety and operational objectives, primarily using stopping sight distance and signal progression.

How can a designer apply these guidelines to a project he or she is working on? The first step is to ask the district planner to identify the recommended AM class of that road section. For a new roadway, the AM class can



Example of classification (Rural Class I) and associated standards

be determined based on the proposed functional class and forecasted volumes and using the charts in the KTC report. Most new roads will likely be a Class I.

Once an access classification is determined, identify the associated guidelines. These guidelines were developed to assist designers in matching the appropriate access spacing to the desired functional goals. If signal spacing is too dense on an arterial, traffic flow will be inefficient. With driveway and access spacing too close, conflicts and crashes will be higher.

Different than the approach used with PC access, the guidelines can be applied with flexibility. When making decisions regarding individual parcels along a reconstructed route, the concept of risk management should be followed. For example, if the desired driveway spacing is 1,200 feet and there is a raised median, what should be done about a single family house located 500 feet from a cross road? Should a 500-foot frontage road be constructed? Should the property be purchased to avoid the need for a frontage road? Should the driveway remain in place and made right-in/right-out through use of median control? If the last option is chosen, the cost of ROW and frontage road is avoided and the volume of traffic conflicts is minimize.

For new alignments, using the guidelines is simpler and can be adhered to more closely. In fact, the project team may decide to implement goals of AM spacing that is even greater to enhance long-term safety and mobility.

After using the AM guidelines to make decisions on intersection controls, access locations and median design, you may want to ensure that what is built remains constant for years to come. Project teams from around the state are now using Memoranda of Understanding (MOU) to accomplish just that. A MOU is a legal agreement, typically between KYTC, the local government(s) and the metropolitan planning organization (MPO), if applicable, that adopts an AM plan and then specifies that future permitting and traffic control decisions abide by that plan. It may also specify the process the participating agencies can use to coordinate, review, and agree upon modifications. Using a MOU prevents the issue of a developer playing KYTC permitting against local planning and zoning in order to acquire an undesirable access point.

There is a myriad of AM information including the KTC report, examples of MOUs and AM design features in the Congestion Toolbox (*http://www.congestion.kytc.ky.gov/*) Future issues of the newsletter will highlight innovative design techniques that can be used to help meet the AM goals.

by Brent A. Sweger, PE, AVS

Upcoming Training:

Kentucky Engineering Center: (kyengcenter.org)-many more online

- **Sept. 10-12, 2012** — 2012 KYTC/FHWA/ACEC-KY Partnering Conference Galt House Hotel & Suites, Louisville, KY
- **Sept. 18, 2012** — MicroStation I for Civil Professionals (four days)
- **Sept. 25, 2012** — Somerset Regional Engineering Seminar
- **Oct. 2, 2012** — Bowling Green Regional Engineering Seminar
- **Oct. 16, 2012** — MicroStation I for Civil Professionals (four days)
- **Oct. 23, 2012** — Project Management Concepts for Engineers
- **Oct. 30, 2012** — InRoads I (four days)
- **Nov. 14, 2012** — Modeling in 3D MicroStation/InRoads (three days)

Farewell

We would like to thank and bid farewell to our summer employees.

Emily Shocklee, a Kentucky Transportation Cabinet (KYTC) Civil Engineering Scholarship student, created the Constructability Review Database while completing her Master of Science in Civil Engineering at the University of Kentucky. She assisted us with initializing the database and in planning a merge of the Quality Assurance Branch's data into a single system to allow more efficiency in analyses and process improvement. She returns to District Two in the project delivery and preservation section in Madisonwille.

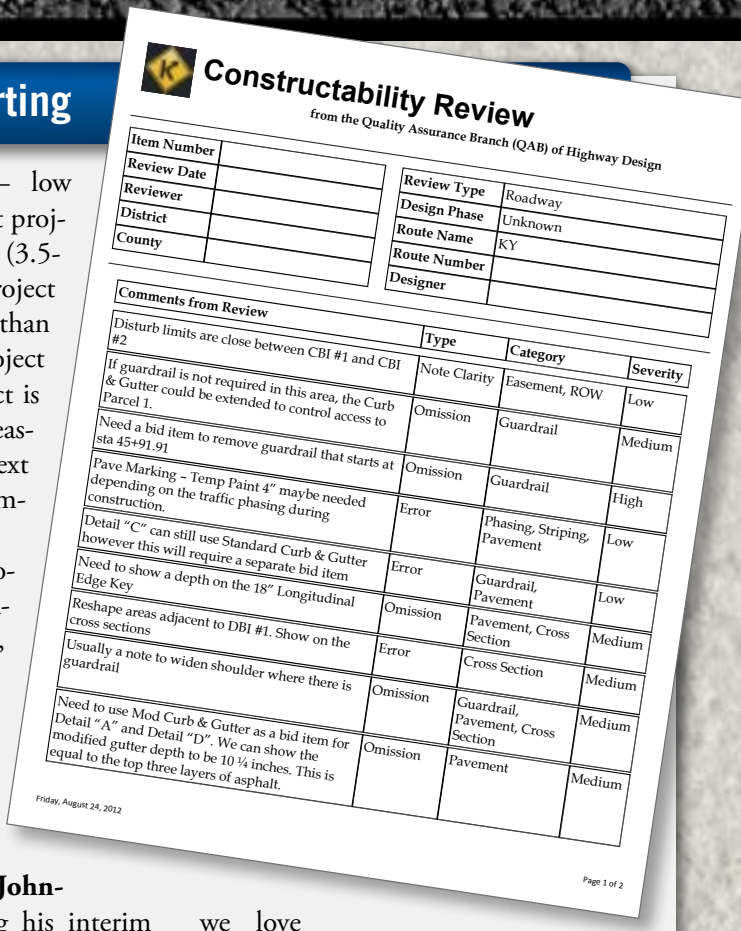
Erica Barefield, a KYTC Civil Engineering Technology Scholarship student, assisted us by transcribing past post construction reviews into the Lessons Learned Database and designed a new layout for our office space. She also spent time training, improving her skill set and making contacts across multiple divisions. She returns to school at Bluegrass Community and Technical College for her final year.

An Update on Constructability Review Reporting

As mentioned in our previous issue, the Constructability Review (CR) program has an ongoing project with the Kentucky Transportation Center. Phase One of this project is complete with the development of our constructability review database featuring data entry forms and reports for our reviewers. These features will streamline and build consistency into the CR program. With the new categorization process, we will also have increased functionality, data analyses and reporting opportunities. We are also excited about the next phase of the project that will attempt to quantify the value of constructability comments, a research area of limited study.

Here is what you can expect to see in future CR reports:

- Consistent report format across all reviewers
- Comments categorized by type (error, omission, note clarity or plan clarity)
- Comments categorized by severity (based on potential cost and schedule effects) — low (less than 3.5 percent project cost), medium (3.5-10.5 percent of project cost), high (greater than 10.5 percent project cost). Schedule effect is a binary factor increasing severity to the next level if there is an impact.
- Comments categorized by project feature (earthwork, maintenance of traffic, right of way, etc.)



Constructability Review

from the Quality Assurance Branch (QAB) of Highway Design

Item Number	
Review Date	
Reviewer	
District	
County	

Review Type	Roadway
Design Phase	Unknown
Route Name	KY
Route Number	
Designer	

Comments from Review	Type	Category	Severity
Disturb limits are close between CBI #1 and CBI #2	Note Clarity	Easement, ROW	Low
If guardrail is not required in this area, the Curb & Gutter could be extended to control access to Parcel 1.	Omission	Guardrail	Medium
Need a bid item to remove guardrail that starts at sta 45+91.91	Omission	Guardrail	High
Pave Marking - Temp Paint 4" maybe needed depending on the traffic phasing during construction.	Error	Phasing, Striping, Pavement	Low
Detail "C" can still use Standard Curb & Gutter however this will require a separate bid item	Error	Guardrail, Pavement	Low
Need to show a depth on the 18" Longitudinal Edge Key	Omission	Pavement, Cross Section	Medium
Reshape areas adjacent to DBI #1. Show on the cross sections	Error	Cross Section	Medium
Usually a note to widen shoulder where there is guardrail	Omission	Guardrail, Pavement, Cross Section	Medium
Need to use Mod Curb & Gutter as a bid item for Detail "A" and Detail "D". We can show the modified gutter depth to be 10 ¼ inches. This is equal to the top three layers of asphalt.	Omission	Pavement	Medium

Friday, August 24, 2012

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We are excited to have **Rodney Little** return to our group of reviewers as we say farewell to **Byron Johnson**, who is just finishing his interim nine months. **Gary Raymer** will continue his interim status for a few more months. Our group of reviewers has an extraordinary amount of experience and we love to provide assistance. Our office can help with your constructability questions.

by Roy Sturgill, P.E.

Quality Matters Staff Spotlight:

Jonathan West joined the Quality Assurance Branch in June 2012. He began his career with the Kentucky Transportation Cabinet (KYTC) in 1996 after graduating from Western Kentucky University with a Bachelor of Science in Civil Engineering Technology as a Transportation Cabinet scholarship student. He worked in District Three project development until 2005, during which time he completed a Bachelor of Science in Civil Engineering at the University of Kentucky. He resigned from the Cabinet in 2005 to pursue a career in private practice and returned in 2010 working in District Four as the Elizabethtown Section Engineer in project delivery and preservation (PD&P).

In his role as post construction review (PCR) coordinator, West seeks to enhance the process of connecting PD& P and project development by providing constructive, informative feedback through an easily accessible media. He is excited about the opportunity to affect positive changes in Cabinet processes and policies as a result of the PCR program. The goal of the PCR program is to identify and review four projects per district annually.

With the FY13 PCR cycle under way, expect to hear from West about upcoming meetings that need your input.

Lessons Learned

This is the third installment of our ongoing series titled "Lessons Learned from the Post Construction Review Circuit" as the Quality Assurance Branch continues to meet with the districts soliciting input from KYTC staff, design consultants and contractors. We chose to highlight the following issues that arose during some of these discussions.

Paved Shoulder Width Decision Making

Depending upon driving lane widths, paved shoulders can be difficult, even impossible, to construct in accordance with design plans and Cabinet specifications. Issues associated with shoulder paving are highly dependent upon the paving contractor and their particular equipment. The amount of paving options increases when the combined shoulder and lane width is manageable in one pass as opposed to two.

Another benefit of paving the shoulder and driving lane monolithically, is the elimination of the longitudinal joint. It is important the project team consider the combination of shoulder width, lane width and the locations of slope changes and shoulder breaks. If this combination of factors is not properly addressed, the pavement cross slope may be impossible to construct as designed. Paved shoulder widths that are less than 10 feet should be carefully reviewed with input from construction personnel for constructability and specifically cross slope placement issues.

Maintenance Stone Quantities

Opinions differ over the use of traffic-bound base, dense graded aggregate (DGA) and crushed stone base (CSB) for maintenance of traffic purposes. Some have expressed a preference for plans to allow flexibility by including a general bid item for maintenance stone, rather than specify the type.

There is also a wide range of opinions regarding where these items should be used, when they should be considered incidental and how to handle paving. What construction personnel do agree upon is that designers need to be aware of the differences between these items when they draft their maintenance of traffic notes. Another common issue associated with maintenance stone involves the difficulty of accurately estimating quantities creating overruns.

In the past, it may have been considered sufficient to merely set up some sort of token quantity, but doing so can result in a couple of undesired consequences. First, an inaccurate estimate could provide insufficient quantities, which necessitates a change order. Secondly, the Cabinet may accept a less favorable price based on the inaccuracy of the original estimate.

One possible alternative involves incorporating maintenance stone quantities into CSB or DGA quantities by including a note explaining there are "X" number tons of DGA or CSB set up for temporary maintenance purposes.

Coordinating Intersection Striping Plans with Signal Plans

Construction forces have been pleading their case that there should be a greater impetus among designers to consistently provide striping plans for every intersection within a project's limits. While intersection striping plans prove to be helpful during the construction phase, discrepancies between striping plans and signal plans are a common source of confusion among contractors and inspectors. Typically, designers are responsible for developing intersection striping plans. While signal plans are usually submitted later in the process by Cabinet staff. Due to this disconnect, these plan sets would greatly benefit from increased coordination and review.

by Nathan Wilkinson

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Lessons Learned Database Available Online

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