

**FAQ's FROM MoDOT PRACTICAL DESIGN
REGIONAL MEETINGS JAN. – FEB. 2005
(3-18-05)**

- Table of Contents -

Design Standards.....	2
Design Exceptions.....	3
Life Cycle (Get In, Get Out, Stay Out).....	4
Roadblocks/Hurdles/Stumbling Blocks.....	6
Safety.....	7
Liability.....	8
Planning Issues.....	9
Central Office Processes.....	11
Value Engineering.....	13
Construction.....	14
FHWA.....	15
LPA/Off-System.....	16
Bridge.....	17
Consultants.....	18
I-70 (and other existing environmental documents).....	19
Access Management.....	21
Right of Way.....	22

Design Standards

Q. Will cost saving measures drive policy change?

A. Yes, division heads will identify best practices and new policies will reflect these changes. We do not want to change the PDM and other manuals yet, but we want to identify the flexibilities that they can include in the future. These documents are a starting point; they should only be used as guidelines. We'll realize savings by people working together, not simply by changing policies.

Q. What if a consultant proposes to use another standard?

A. If it can pass a practicality, or reasonableness test, then so be it. We have got to get it out of our heads that there's only one standard. There are many standards. The PDM, BDM, MUTCD, Green Book, Roadside Design Guide, APWA, etc., are excellent places to start. But to be successful we need to take those accumulations of best practices and let them spur us to think "outside the book."

Q. How creative can we get when designing roads and bridges on our system?

A. Be as creative as the type of roadway and bridge will allow. For instance, an interstate or major NHS route will allow very little creativity, not to say that none exists. We will have to hold these routes to a higher level of design guidelines. However, our collector and local type roads are basically an open door to creativity and good engineering judgment. Remember, regardless of the road type, we **MUST** document our decisions.

Q. Is statewide consistency a thing of the past?

A. Missouri does not now, nor will it ever, have statewide consistency on its system, not even within the same functional classification. Ingenuity is the heart of practical design; striving for system continuity at the expense of practicality will only serve to hamper this creativity.

Design Exceptions

Q. What is the design exception process for practical design?

A. All design exceptions will continue to use the current form, but will be approved by the District Engineer instead of the State Design Engineer. Full FHWA oversight projects will require the additional approval of the FHWA and should be sent to the appropriate TSE in Design. Bridge design exceptions will require the additional approval of the Bridge division and can be initiated by the Structural PM or the District PM and approved by the State Bridge Engineer.

Q. How does liability apply to design exceptions?

A. We have a better defense when we provide a safe system, whether it's a good project or great project, whether it's "standard" or "non-standard." If an individual engineer is questioned and has followed MoDOT's overall vision, he/she will have no personal liability. A well-documented project design is critical.

Q. Will there be problems associated with a request for Design Exceptions?

A. Not really. We are adding value to the system by using narrower lanes and bridges. We have to justify the exceptions, and we still have to use good engineering judgment, but this is really an issue of good documentation – not permission.

Q. We send in a Design Exception and we're told to use our standards. Where do we go?

A. We are not going to use standards just because that's the easy way out. We are striving for flexibility to fit within what are essentially guidelines. You will need to gain concurrence with the District Engineer. Start there, then go to your liaison.

Life Cycle (Get In, Get Out, Stay Out)

Q. How do we address saving money up front vs. life cycle? Where does the “Get In, Get Out, Stay Out” fit in this culture? Is it acceptable to disregard life-cycle costs and perhaps design a project that lasts only a certain amount of time?

A. All good questions. Suffice it to say that these issues need to be early discussion points. At this point in time, the need to bring Missouri’s statewide system up to the “good” level overshadows the need to stay out of one particular location for a long period of time.

Obviously, high traffic areas, or areas presenting other construction difficulties should be designed for a longer-term solution. The Blanchette Bridge in St. Charles is an example that comes to mind.

But overall, we probably need to remove the “Get In, Get Out, Stay Out” phrase from our vocabulary. It should be a part of our thought process, but not the driving factor. We need to look at the benefits that a long-term solution would bring to a project, but also consider if that additional cost is beyond what is really needed. The answer will be different for each project. However, this past culture should be part of the thought process, but not a driver. Yes, it is okay to design a project that will last a shorter amount of time, but life cycle costs still need to be considered.

Q. How do we provide a product that is the least inconvenient to the customer at the least cost?

A. We have to think about our customers, collaborate with them, and determine what is the right thing to do. But we are not willing to drive up costs simply to reduce inconvenience.

Q. Can we close more roads to finish projects sooner?

A. Absolutely. This should be a consideration during the design process and a key component to the public involvement program. We have closed over 100 roads in recent projects to complete projects sooner and public praise, not criticism, has come our way.

Q. When dealing with flooding issues, and the “Get In, Get Out, Stay Out” motto, are we going to use this program?

A. “Get In, Get Out, Stay Out” goes a little too far. The context of the project location is key. We’re not saying to build a deficient solution, but we’re also

not saying to build a 100-year bridge. If the roadway on either side of the bridge is going to flood anyway, or the next bridge down the road will flood, then a lesser solution is in order. If it will go under water occasionally, we're okay with that.

Roadblocks/Hurdles/Stumbling Blocks

Q. How do we (including consultants) handle roadblocks in the process?

A. The arbitration process will work as follows: roadblocks should be resolved at the lowest level possible, for instance between the project manager/project development engineer and the liaison. If an issue continues, it should be elevated for resolution between the District Engineer and the Division Engineer. Only after these steps have been exhausted and no resolution has been achieved should the issue be elevated to Dave Nichols or Kevin Keith.

Q. How do we handle a situation where a pay item doesn't exist for something we want to do?

A. Don't let this hamper your process. We need to capture these ideas and begin to address them. If the need is common, then standard pay item needs to be established.

Q. A lot of what we're doing requires that we interact with other folks who don't think we're doing the right thing. Can you help with that?

A. We will not all agree, and that's okay. We have to have these disagreements to find out exactly what will work. Follow the process detailed above to resolve these issues.

Q. Consultants are looking at many projects. Are we to stop all of them and re-evaluate? Are we to rework, re-scope and redo?

A. Yes, wherever you can. Take another look at the work and see if there is some aspect of the project that warrants a change. We don't want to delay the letting, if possible. Do not forget to re-evaluate the environmental document whenever you look at revising a project. This should be done as one of the first steps after *any* change of the scope.

Safety

Q. Should we be looking at scaling back such incidentals as guardrail, striping, and lighting?

A. No. Don't go for what looks like an easy answer. Remember the first ground rule – every job will be safer.

Q. Should we stay with video detection?

A. This is good equipment, which has very specific applications to very specific situations.

Q. How does safety weigh in on projects? Ex. accidents, fatalities, fix curve, etc.

A. Safety is very important! We want to spend our resources on the aspects of a project that will impact safety the most. Analyze what the cause has been of very serious accidents at the location in question and fix the situations that cry out for improved safety.

Liability

Q. How does liability apply to design exceptions?

A. We have a better defense when we provide a safe system, whether it's a good project or great project, whether it's "standard" or "non-standard." A well-documented project design is critical.

Q. What about my liability as a designer?

A. As a MoDOT employee, you have zero personal liability as you are applying the direction of the department. Document all decisions, keeping track of why we decided what we did! The individual is not at risk. We believe we'll be in a very defensible position by making the statewide system better as every project gets safer.

Q. What will happen if MoDOT is called in as a third party in litigation? We will rely on documentation of our decisions, but opposing attorneys will only be concerned with standards?

A. In this business, litigation is a fact of life. If someone wants to sue, they'll sue. MoDOT is free to set its own standards – ISTEA provided for the states to determine standards for non-NHS routes – and does not have to conform to others (AASHTO, etc.). As long as we do a good job of documenting our decisions and the process used to make them, our legal counsel will have the opportunity to make a good defensible case.

FHWA has celebrated MoDOT's move to "practical design," even where federal aid is involved. They still desire, and need, to be included on core teams where they will have the opportunity to express concern if a design element goes too far outside the box. FHWA still approves standards used on NHS routes.

Planning Issues

Q. To what does the 10 percent that we're currently trying to cut apply?

A. It affects what is in the current STIP and we'll realize those cuts by the end of calendar year 2005. We also want to try and identify as many savings as we can before the next draft STIP goes to the Commission in May. You can begin programming new projects with the money that has been saved in the next draft STIP.

Q. I have money in the STIP but no project identified. Am I expected to save 10 percent on those projects when they are identified?

A. No, but you need to design and build those projects wisely and efficiently in the spirit of this new philosophy.

Q. Will politics continue to dictate a project's scope, location, etc.?

A. Yes, we will continue to have instances where this will happen. However, we want to apply this culture to minimize the influence of politics as much as possible. We'll never have a purely engineering-driven process ... never have had; never will. But if we're in a situation where we must bow to a politician, we may have to ask them to pony up some money.

Q. What about the bicycle/pedestrian aspects of projects? Will they be affected by this philosophy?

A. Maybe. We obviously want to build bike/ped facilities where they are warranted. However, when we apply these concepts we may not be able to accommodate the wants of a community unless they are willing to share in the cost.

Q. What about ADA policies?

A. We will find a way to adhere to state and federal policies and laws and continue to save 10 percent while carrying this design philosophy into future projects.

Q. How do we balance how we have been entertaining public input in the past and the new direction of not chasing what the public wants?

A. We need to work harder to manage public expectations and be realistic. Good public involvement is not giving in to all public desires. This new process does not make interaction with the public easy, but we need to continue to meet the public and hear their concerns. At the same time, we need to inform the public about what we need to do with the financial resources we have available.

Q. We are reducing the STIP by 10%; does this mean every project or just aggregate?

A. The expectation is that every project will be examined for cost savings. The bottom line, though, is that the aggregate of all projects will be reduced by a minimum of 10 percent. Districts get to keep the money they save to go towards new projects.

Q. Here's an example – 763 in the urban setting of Columbia, with ADT of 35,000. We've worked with the city, and have reasonably applied access management. To save additional money, are we comfortable with building cheaper by utilizing a 5-lane TWLTL (or a 3-lane TWLTL in another setting)?

A. Be realistic – in reality it is a city road, not a major highway, so get flexible. We are not going to build a city street to maintain traffic to last 30 years. If the developer/community wants it, maybe they should pay for it after they understand that there is only so much money that we can bring to the project.

When you are looking at future traffic, do not worry about a 30-year model (Now, we will look at major interstates differently.). It's really only a guess anyway – not gospel. Again, do not forget to revisit the NEPA document to make sure any necessary revisions are made.

Central Office Processes

Q. Do we have the staff to fully make this happen?

A. From the Project Development and Construction standpoints, probably not. But as a total department we must make every effort to embrace this change in order to succeed. An “all hands on deck” approach will enable us to make significant gains.

Q. How will we as a department capture the decisions being made?

A. Good communication (ground rule #2) is a key to this entire change in philosophy. Districts need to document their decisions and share them with Central Office so that we may begin to shape our new parameters. Design has developed an Intranet site (wwwi/cadd/pd) that will serve as a clearinghouse for best practices, success stories and the like.

Q. How will our review process be affected by this?

A. We will not add more reviews or more steps to the review process because this would only serve to slow things down. We need to streamline the delivery of this process.

Q. Are we going to consolidate maintenance facilities as a way of reducing facility costs?

A. Yes. This philosophy applies to everything we do at MoDOT and extends to every level of the organization. Treat our resources like it’s your own money; in other words, be frugal.

In a related matter, remember, Amendment 3 money will go only for road construction. We will not hire any new employees with this money, and we will not build any new buildings during this timeframe.

Q. Will there be an extra process to go through at Central Office after the scope has been signed off on? With whom should we coordinate major scope decisions?

A. We are not going to put another layer of bureaucracy in place. Again, communication between the core team and the design liaison at Central Office is important and needs to begin early. Everything feeds off of a properly developed scope, which will set the project on course to finding the right solution. The answer for each project will be different.

Q. Who should we meet with on project design?

A. Core team ... Central Office staff ... FHWA (on full oversight projects or whenever additional information is required) ... the public (remember: manage expectations).

Q. Has anyone talked to the Corps of Engineers about more frequent impacts to streams?

A. No, but we will talk with the Corps of Engineers, and we will continue to get the permits we need. You'll need to involve the Corps earlier, since they will determine the range of decisions we can make, which ultimately will become the cost driver of the bridge. How long will it be? How wide will it be? How high is it? etc.

Q. What is the overall vision of practical design?

A. The overall vision is clear and unwavering as indicated by both the Director and the Chief Engineer. We will employ common sense and practicality to all our designs in order to bring the entire MoDOT system up to a "good" status. Most districts have applauded this direction. Unfortunately, the execution of the policy is much less clear. During the coming months, the Design Division will work closely with the districts and other functional units to work out the details of implementation so the vision becomes the everyday culture of MoDOT.

Q. We may now be led to design solutions that ultimately we are not proud of, and will be considered failures. How will MoDOT view these?

A. "As Successes!" We are going to build some projects with features that we do not like. We will make mistakes. But we'll learn from those and move forward.

Value Engineering

Q. Will we now entertain a Value Engineering proposal where a contractor proposes to reduce a shoulder width from six feet to four feet?

A. Yes. We will encourage and entertain any Value Engineering proposal that involves a “better, cheaper, faster” solution. However, the practicality of any such proposal needs to be discussed with design staff. We will also monitor construction-side V.E.s and try to incorporate our findings into design policy.

Construction

Q. Will the three percent inflation rate be bumped up?

A. No, in fact it has been reduced to two percent, and the construction contingency has also been changed from three percent to two percent.

Q. Should we be looking at a uniform approach to borrow – MoDOT- or contractor-furnished – rather than the Spec Book method? How do contractors avoid being delayed? They think it can take up to six weeks to get environmental clearance?

A. We never want to be in a situation where we determine “always” or “never.” Different methods will be advantageous to different projects. Just because the contractor furnishes borrow does not relieve us of the responsibility for the environment. Resident engineers still need to adhere to environmental and cultural resource requirements, and if they have a sense that delays may occur, they should make immediate contact with the environmental section at Central Office.

If a contractor feels he was delayed, and lost money, because of clearance issues, it is his responsibility. Our REs say they have never seen a contractor held up due to the environmental clearance process.

Q. Will this be a success if market volatility, oil and steel prices and other things out of our control drives price more than what designers do?

A. If that’s the case, we’ll still be money ahead of where we would have been had we not gone through this process, and we will have brought more value to Missouri. In the long term we will be successful because we have changed our approach. In the short term we will be successful because to jump-start this change we’re going to save 10 percent in the current STIP. That will generate another \$160 million for needed improvements statewide.

FHWA

Q. What does FHWA think of the practical design philosophy?

A. They are on board and support us in this effort. FHWA has told us, “We don’t set the standards; you do.” FHWA’s responsibility is to make sure that we comply with what we set – primarily on NHS routes. So, there’s no passing the buck – “We have met the enemy and he is us.”

LPA/Off-System

Q. How do we handle the off-system work that we administer?

A. Handle it as if it were our own system/project.

Q. Are there going to be changes to the LPA manual?

A. All manuals that the department uses will be revised to reflect this culture.

Q. How do you see design and liability issues on off-system projects?

A. Standards need to become more flexible. The standards we adopt must pass a reasonable test and be approved by FHWA for NHS routes in order to qualify for federal funding. They do not have to conform to AASHTO or others. Remember, cities and counties are spending our money on these projects, and the more we save on each project allows us more money to spend on an improved system.

Q. Should standing municipal or county agreements be renegotiated as a result of practical design scope changes?

A. Absolutely. We do not want to damage our credibility with a “bait-and-switch” relationship with local governments.

Bridge

Q. Do we design to design-high-water (DHW)?

A. Determining what the design frequency will be on each project needs to be part of the early discussion between the Bridge division and the District.

Q. Bridge replacements face issues such as bad curves, fatalities or flood frequencies of five years. We can't put a five-year design bridge in a five-year flood location. When do we decide to use a 50-year flood plan or 100-year flood plan, etc? Where do you draw the line, and what range are you comfortable with? Who is making the rules and decisions?

A. Engineer these situations! Look at the purpose and need and make a decision. Again, consider the context. We will never again be able to go to a chart in a manual and pick a solution. Remember our first ground rule – any improvement we select is going to result in a project that makes the location safer.

Consultants

Q. Will we be more flexible in allowing our consultants more time and negotiation to help make this happen?

A. Consultants are our partners, and as such, we're in this together. We are looking more at how they have "skin in the game." We may look at ways to develop incentives for consultants who generate cost-savings, but we are not looking at slowing down the process.

Q. How will scope changes in existing consultant jobs be handled?

A. At first, it will likely cost us more money on the design side. Each project will be different, but the money saved on the construction side should more than offset the design increase. In the future, everyone will agree on the scope and very few supplementals will arise.

Q. Being creative means we have to use experienced, higher-paid people. Will this cost more money?

A. A cost increase is unlikely. Consultants are being too competitive, and we are going to change how we contract with them. The incentive is to bill more hours and spend more time to give us a great project. Not even an expectation. We will be sharing savings with the contracting community. The standards will be modified as guidance. Standards allow us to build bridges/roads that do not need to be there.

Q. Will our relationship with consultants change?

A. Consultants are our partners. We all understand what the objective is. Our expectation is that they will deliver us an outstanding project on time, and on budget. That's the same expectation that we experience every day with the public – on time, on budget.

I-70 (and other existing environmental documents)

Q. Will we go back and re-look at the I-70 corridor and try and apply some cutbacks and scale-backs.

A. Yes, when we are ready to design and rebuild I-70 we will match our solution to our funding, within the guidelines set forth in the I-70 studies while maintaining the concepts approved during the process.

Q. What is the practical design impact on I-70?

A. Significant. The environmental documents showcase the Cadillac version as the preferred alternative. However, that does not mean it's not the RIGHT solution.

The I-70 solution is based on several criteria:

- The solution needs to look out 30-50 years to accommodate the needs of the future.
- It must be reconstructed and widened while maintaining four lanes of traffic, none of which can be head-to-head.
- There needs to be continuous frontage roads to provide duplication for the system.
- Access management must be implemented as we rebuild each and every interchange.

These are all proactive and appropriate conditions upon which to look at solutions, but they do not take into account the financial problems associated with funding it. For example, implementing access management on all of the 53 interchanges adds more than \$500 million dollars to the price. A practical design approach will evaluate these interchanges and only apply access management where needed at the time of reconstruction.

However, since funding has not been allocated for the reconstruction and it's anybody's guess as to when funding will be available and which interchanges will need access management at that time, for these studies ALL interchanges were treated equally and the worst-case footprint (maximum access management) was evaluated. Each of the fundamental elements listed above has a price tag associated with it that will need to be evaluated at the time of design so that we build the right solution, but one that fits in with the master plan for the entire corridor. Ask yourself, can we live with only four lanes in most of the rural stretches of I-70 if the pavement was in good shape? For many years, probably 20 or more, yes we can. But if the traffic history on this corridor and the future projections are even close to being accurate, when we rebuild the existing four lanes we need to make sure they accommodate two more lanes in

the future without major impacts to the citizens of Missouri, and they need to be coordinated with areas such as Columbia where six lanes are needed today.

I-70 is a system across our state and as such needs some consistent elements and a coordinated approach. When we finally get to rebuild and widen this corridor will it look just like the exhibits in the environmental document? No, not for 200 miles, but in locations, yes it will. In recognition of our funding situation, the capstone for the I-70 studies will be an implementation plan that does consider funding and priorities. This implementation plan will propose various scenarios for less than full buildout based on various funding amounts.

Q. What about other corridors that have environmental documents sitting on the shelf? Will we build the solutions contained in these documents or start over?

A. All environmental documents contain what we call the “ultimate solution.” The Purpose and Need in these documents defines the problems that the solution MUST correct and they always look out in the future 20 or 30 years. For example, we have many environmental documents that looked at corridors destined to be freeway facilities sometime in the future. But, reality is that they do not need to be a freeway today and why most of those corridors are being planned as expressways. And in some cases, the first phase of construction may be an improved two-lane. Implementation needs to be discussed in the environmental documents so that expectations from the public do not exceed our ability to fund solutions. But at the same time, our Purpose and Need statements must also reflect the real purpose and need for the project and not contain elements that we never intend to address. Purpose and Need also needs to be measurable. When you say you want to decrease congestion on a road, what is the measure? Will LOS D in the future be adequate or does the solution need to provide for a LOS A?

All existing environmental documents and their preferred alternatives will need to be re-evaluated as we move forward with these projects. While the ultimate solution contained in the document may not be fundable, the concepts and the commitments are still valid and the ultimate solution can always be ‘phased in’ over time as funding becomes available, assuming it is still the ‘right’ solution. In some instances our Purpose and Need may have changed over time and the document may need to be re-opened and our preferred alternative may be drastically changed. All of this can be done under the NEPA framework.

Access Management

Q. How does access management fit into this?

A. Access management has never been anything more than a guideline and will continue to remain as a guide. Access management is an important tool and should be applied where appropriate on a project-by-project basis.

Right of Way

Q. Does this apply to the buying of right of way?

A. Right of Way has to be looked at as part of the whole process. The decisions we make early in the process can have a dramatic impact on the need for Right of Way later on. We need to look at every possible option that enables us to reduce the cost of Right of Way. That could mean looking for donations, cost-sharing, etc.