AASHTO/AGC/ARTBA Task Force 13 Meeting
April 28 and 29, 2005
Columbus and East Liberty, Ohio

Jim Kennedy welcomed the Task Force to the facilities of the Battelle Memorial Institute the site of Thursday's meeting. Approximately 20 buildings are part of the complex adjacent to the campus of The Ohio State University. He apologized for the delay that was due to security required by the Dept. of Defense. He also covered housekeeping matters and logistics for the Task Force events over the next two days.

Task Force Co-Chair **Pat Collins** of the Wyoming Department of Transportation welcomed all members to the Spring 2005 meeting and introduced himself, industry Co-Chair **John Durkos** of Road Systems, Inc., Secretary Nick Artimovich of FHWA, and Chairman Emeritus **Arthur Dinitz**. Collins noted the great turnout for this meeting, and thanked Jim and Michelle for setting up this venue. He also recognized **Jim McDonnel**, our AASHTO Liaison, for his help in moving things forward. The members present then introduced themselves, noting whether they were first-time participants in a TF-13 meeting. Minutes were approved by voice vote. **Collins** also explained the subcommittee structure for the numerous first-timers at this meeting.

Durkos asked for a moment of silence to mark the passing of long-time Task Force 13 member **Dave Gertz** of TrafFix Devices who developed many products now being used on the highway. Durkos also thanked **Greg Frederick** for his help at registration.

Subcommittees:

#1 - Publications Maintenance:

Nancy Berry linked a computer to the www.aashtotf13.org website and showed changes that she has made since our last meeting. Subcommittee 8 (Rail Highway Crossing Hardware) has posted on-line its brochure listing contact information for individuals and organizations concerned with Rail-Highway Crossings. She also showed the link to former meeting minutes. A Contact Information Form page is also on line, but it is as yet undecided to whom this page should be directed. This form may be used by individuals with questions, or by those who wish to join the Task Force.

There was a recommendation from the floor to have the membership list available on the website. **Berry** will look into this with two caveats: it will have to be password protected (all members having the same password) and it would be a PDF file to lessen the chances of email addresses being added to spam lists. A process to update addresses and other contact information should be added.

Berry asked the co-chairs again for the BENEFITS of the various publications so that they could be posted. Any who have not done so already should forward them to her

promptly. She also recommended that Co-chairs check the web site to make sure the contact information is updated.

#2 – Barrier Hardware

(The Agenda for this meeting had Subcommittees #2 and #8 meeting in separate locations. As the Rail Highway Crossing Subcommittee indicated that its report would be quite brief, the Executive Board agreed to have these two subcommittees meet consecutively with all members present.)

Co-Chair **Will Longstreet** reviewed the task list outlined in NCHRP 20-7 (192). This project has allowed funds for an update of "A Guide to Standardized Highway Barrier Hardware".

Task 1. Survey the state DOTs, FHWA and private industry to identify current barrier systems and components.

Task 2. Develop a standard format for the information collected in Task 1 and convert all system and component information to the standard format.

Task 3. Compile the most up to date barrier components and systems into the updated "A Guide to Standardized Highway Barrier Hardware, 1995"

Task 4. Post updated Guide to the Task Force 13 website.

Task 5. Establish an ongoing process for updating the publication.

Mac Ray gave us an update of this project to establish procedures for updating the Guide. All files have been transferred to TTI and **Ray** is in contact with them for updates. He referenced the www.aashtotf13.org web site that has information on the update process. The proposed 5-step process for updating any individual standard (as outlined below) may be found at the Member Resources page at http://aashtotf13.tamu.edu/process.htm (If the hyperlinks included in the five steps listed below do not work, go directly to this website to try them out. It's ok to do it right now. I know you'll come back here and finish reviewing these minutes. Right?)

1. Agencies or individuals submit hardware information for addition to the Guide. The first step is to prepare a drawing and specification conforming to the standards.
2. The submitter requests a hardware designator. A volunteer from AASHTO Task Force 13 assigns a designator to the new hardware and creates a discussion area for it on the website.
3. The submitter provides the drawing and specification in PDF format, which are then posted to a web directory for public viewing and comment.
4. The Task Force 13 members review the submissions and comments and vote on approving additions to the Guide.
5. If Task Force 13 approves a submission for addition to the Guide, it is added to the online Guide and the comments are archived. If Task Force 13 votes not to add a submission to the Guide, the submitted material and comments are also archived.

Ray showed the www.aashtotf13.org web pages under Publications - Barrier Hardware and showed Index of Names, which currently link to the drawings in the 1995 guide. Member Resources page noted above links to the work in the new guide.

Ray outlined the survey results. Survey did not reveal any hardware to be removed from the new guide. However, the plan is to delete non-350 tested hardware. **Harry Taylor** asked to keep 1995 guide on line, and Mac agreed that should be done. The survey results suggested a number of new hardware items suggested, mostly proprietary products developed since the mid 1990's.

The standards for drawings and specs are also on line and currently link to either MicrsoStation or AutoCad. Artimovich suggested that a PDF of the blank page also be included so that small-time operations could download the image and add their drawing.

In step 2, the petitioner requests a hardware designator. The designator system is a way of organizing hardware and parts. Jennifer Wier still handles this, but TTI has volunteered to handle this for the near term.

The discussion board that members will use to comment on proposed standards is currently hosted by ProBoards. Owner of drawing needs to review comments and address them. **Ray** asked members to view the site and make comments, join discussion boards, etc. So far, there is no method for informing people of comments posted to the discussion board. He suggested that many of these drawings be developed, posted, and voted on by next meeting. **Ray** was asked if TF members should be notified whenever a new drawing is posted. He will consider this, but for time being will just send a notice to members prior to next meeting informing members of new hardware.

Subcommittee #5 on Sign and Luminaire Support Hardware agreed that the same template should be used for sign and luminaire supports also.

Metric option should be required for approval. This is up to the Task Force. **Berry** reminded us that the TF agreed that English (metric) would be our standard.

Should this be required as part of 350 update? Although the preparation of drawings for the Task Force 13 web site is not really a part of the crash test process, it would make sense to have these pages developed as part of the crash test effort rather than coming later as part of a submittal process under AASHTO. As FHWA is going to require the drawings to be submitted in this format prior to reviewing them for acceptance, TF-13 should not have a problem obtaining the drawings in the proper format.

Longstreet suggested a few common drawings be posted and have all TF members review them prior to the next meeting as a "dry run" of the process.

Berry asked what would be the future maintenance effort to keep this document up to date. We will need a "traffic director" for the designator, discussion board, and moving

files from discussion board site to the publication site. Once in "normal" mode one person should be able to do this as part of their regular job. It will, of course, be a significant effort to do this initially. **Longstreet** suggested we consider having a paid position to be the "traffic director" and Ray was asked to provide an estimate. TTI volunteered to be the "traffic director" for the immediate future and get an estimate of the costs for long-term maintenance. As noted above, TTI agreed to take on this task for the near future.

Ray asked that if you have any "markups" of the 1995 drawings please submit those to him for review. He also asked for volunteers for a more focused group to review drawings as part of this process.

********** **TO ALL TASK FORCE 13 MEMBERS** **********

PLEASE REVIEW THE WEB SITE PRIOR TO THE NEXT MEETING, AND COME PREPARED TO DISCUSS YOUR COMMENTS.

#8 - Rail Highway Crossing Hardware.

As noted above, the brochure is already on line (see http://www.aashtotf13.org/Subcommittee-8-Rail-Crossing.asp and click on **Associated Railroad and Grade Crossing contacts** . **Dean Alberson** said they plan to update list of contacts once a year. They will begin by checking the validity of the names and address by sending out e-mail to all on the list. They will also be contacting three additional from the Federal Railroad Administration who will be invited to attend our next meeting in hopes that they might have insights to share with our committee.

Durkos showed a video of a train collision with a semi that was taken by someone who set up a video because he anticipated a crash due to perceived hazards. Some accused him of staging the event, but he maintains that he recognized how dangerous the crossing was due to its proximity to a signal-controlled highway intersection and it was just a matter of time before a crash occurred.

Break – Prior to lunch, **Dinitz** showed b/w photos from a series of cable barrier crash tests conducted by Pennsylvania in 1925 using various vehicles and impact speeds.

 # 5 - Sign and Luminaire Supports

Gregg Frederick, subcommittee co-chair, reviewed the minutes from the Irvine, CA meetings. (Mike Stenko was not available.)

Key benefits of the Luminaire Support guide had been settled. The key benefits of the Sign Support Guide need to be drafted. Some of the points from the LS guide and Barrier Hardware Guide can be brought in. The title of the Sign Support book will be "A Manual of Ground Mounted Sign Supports."

Ray completed work on the Barrier template, and our book will use the same. If Subcommittee #5 wants to use the same process for updating our publications as the Barrier subcommittee did, then AASHTO 20-7 funding may very well be available. It was agreed to modify the Barrier subcommittee's 20-7 proposal and submit it for funding. **McDonnell** agreed to coordinate with Keith Cota of AASHTO TCRS and then carry the proposal with him to next week's AASHTO meeting.

Now that we have a standard format for TF13 drawings, it should be sent to all sign support manufacturers of record by FHWA so that they can submit their drawings for the new guide.

Fredrick completed the RFP document for the Luminaire Support guide after reviewed it with FHWA. Project is expected to last 30 months.

1.Review type and extent of support use.
2.Research AASHTO Standard Sign and Luminaire Specs and FHWA letters to ensure all devices to be listed are crashworthy.
3. Develop a new guide in electronic format.

Fredrick reviewed the RFP and noted that some of the tasks need to be reviewed in order to avoid duplication with **Ray's** work. **Fredrick** asked if there were any additional comments. **Carl Micchetto** asked if strength based components would be included. That will be up to the manufacturer as to what they wish to provide.

Phil DeSantis noted great changes in Luminaire supports due to the new fatigue criteria. These result in some very large components that some are unable to fabricate. **Fredrick** asked if the 350 update will have such an effect that we should hold off. The answer is no, we should go forward with updating the guides because we will be putting the process in place that can accommodate these revisions.

Mike Stenko sent an email requesting Artimovich prepare a draft letter to be sent to all manufacturers of record, along with their addresses. A draft of that letter has been prepared and will be forwarded to Stenko.

De Santis noted that cellular pole mfrs now specify that weakest point should be at the first field joint rather than at the base. This ensures the failed pole does not lay across the pavement.

Fredrick mentioned AASHTO Bridge Subcommittee T-11 research problem statement on fatigue of sign supports, luminaire supports, signal poles approved for 2006 funding. **Fredrick** will see if an NCHRP number has been assigned yet. Ballpark $888,000 ?

#3 - Bridge Railing and Transition Hardware

Mark Bloschock discussed the progress of the Guide to Crashworthy Bridge Railings. We have $100,000 of 20-7 funding to compile book of mostly generic rail designs. This funding amount will not allow transitions to be detailed at this time, but may be referenced in a table. The new guide will be based on work of Caltrans and FHWA. The Subcommittee came up with numerous questions, including: Where does Transition hardware go? What about other functions? Sound barriers. Aesthetic. Combination rails? Should the Guide include grandfathered rails under Guide Specs? Show test levels? Working width? Should appropriate retrofit BR be included?

Roger Bligh showed some BR, Retrofit BR, and Transition tests.

#4 - Drainage Hardware – Notes supplied by Nathan Paul

1. Review of Irvine Meeting
    a. Committee still is looking (hoping) for an electronic version of the 1999 Drainage Hardware Manual. ** Later in the general session Jim claimed AASHTO had a "clean scan" that could probably be used to convert the text only into a usable format. Chad spoke up and stated he thought he could convert the entire publication including the drawings. Jim was to forward the scan to Chad**
    b. Nathan will collect and forward benefits to Publications committee by May 9th, 2005, these are to be posted on website.
    c. Funding appears to be a dead end for now; we may be able to apply for NCHRP funds next year.
2. New Business
    a. Nathan Paul replaced Rick Foster as Co-Chair
    b. Discussion on possible mission statement revision. Ultimately it was decided to keep the treatment of stormwater included, but listed as an upcoming agenda item.
    c. Furthermore it was decided we need to recruit some experts in this field and have stormwater filtration as a sub-group of #4.
    d. Create a discussion page
        i. Nathan will contact Mac to discuss options
    e. Enlarge the subcommittee through networking efforts
    f. Tom Simon offered to work on establishing protocols for the group.
        i. Meetings
        ii. Product Updates
        iii. New Products

#6 - Work Zone Hardware

Agreed to continue support of NWZSIC. Discussed ATSSA proposal to label devices. Discussed water filled barriers vs water filled barricades. Had a brief discussion of low-profile barriers.

#7 - Certification of Test Facilities (Thanks to Ron Faller for these notes.)

Once again, the Co-Chairs, Faller and LaTurner, provided a brief review of the goals, objectives, and mission for Subcommittee No. 7. This discussion included the fact that all U.S. test laboratories will be required to become accredited by a third-party organization within the next two to three years. In addition, it was discussed that this Subcommittee will continue to conduct Inter-Laboratory Comparisons (ILC's), and later Proficiency Test Programs (PTP's), as required by ISO 17025. It was also mentioned that the dialogue between laboratories has been good and very beneficial in increasing consistency between testing laboratories.

Harry Taylor of FHWA provided a discussion on the future accreditation requirements as well as highway hardware acceptance. Although specific details were not made available, it was iterated that a draft document may be available for review and comment by the end of 2005. It was stated that test laboratories would need to obtain accreditation if they wanted FHWA to review their crash test reports for acceptance purposes.

The Co-Chairs then discussed the fact that a recent ILC was completed on accelerometer data analysis and occupant risk determination, more specifically OIV, ORD, THIV, PHD, and ASI. Two data sets were analyzed with results provided in the form of handouts. Although greater consistency is showing up between laboratories, there is still room for improvement. A future ILC will be conducted by MwRSF using the same two data sets but now both with and without head offsets. In order to check each laboratories steps in the process, MwRSF will supply their electronic file of the intermediate plots for over-plotting and comparison and those used in the analysis. Each laboratory will be responsible for performing their own checks, making in-house changes if necessary, and then providing feedback to the group. Tabulated results of this ILC are available on a MwRSF server site. Instructions for accessing this site have been made available previously and are shown on the AASHTO TF 13 webpage.

Another high-speed film/video ILC analysis was conducted by Lance Bullard of TTI. The results from this ILC were shown at the meeting and revealed that greater consistence has occurred as a result of this ongoing collaboration and attention given to in-house analytical techniques. In the near future, tabulated results will be archived to the same server location.

A new ILC was begun at the meeting and pertained to the review and comment of test/research reports provided by MwRSF, TTI, and E-TECH Testing Services, Inc. The goal of this ILC is for this Subcommittee to generate recommended guidelines and/or a report checklist for future test reports. It is envisioned that the final recommendations will be forwarded to the NCHRP Project 22-14(2) researchers for consideration in the update and re-write of NCHRP Report No. 350. It was also mentioned that a standardized drawing format may be desired for future test reports. Norman van Oudtshoorn of TUV stated that CEN/En working groups recently generated a recommended report checklist and will provide a copy of this document to this subcommittee for review.

Prior to this meeting, the U.S. test laboratories were asked to bring their preliminary analysis on uncertainty in measurement calculations for impact speed determination to

the spring meeting. Due to the lack of time for discussion and insufficient number of laboratories completing this task, the effort was delayed until the fall meeting. Thus, each U.S. laboratory was asked to complete the task this summer and bring the results to the meeting in Florida.

The meeting was ended with a couple of questions posed to the group. The first question was, "What are your expectations of this subcommittee?" The second question was, "Should crash testing labs for roadside hardware be required to attend and participate in Subcommittee No. 7 activities?"

FHWA Issues:

Taylor indicated that FHWA would continue to issue acceptance letters for the foreseeable future. We will try to make our personnel transitions as easy to the highway industry as possible. These days we have more product developers, we have more test laboratories, we have more conflicts between manufacturers. Our new procedures are likely to involve more work on the part of developers and the test houses. We will be initiating rulemaking on lab accreditation in the near future. FHWA will develop a checklist to be completed and submitted with each application for acceptance. This completed checklist will be required before applications accepted. Some areas are more mature and labs can do more of the work themselves.

Reports from Special Subcommittees

Marketing**, Bloschock** noted that the Task Force is always looking for more DOT members, as many find out of state travel is difficult.

Dave Hubbell asked about barriers that are being used by architects, landscapers, etc., for things like security barriers. There is another market out there besides the highway agencies, and if these other folks learned of our guidebooks it might generate more business. DOD is testing some devices that failed on the civilian side, they just weren't aware. State Department is willing to share information with the public, but Secret Service is not willing. Leo Yodock notes that DOD crash tests are much more severe and do not necessarily relate to our uses as we try to reduce the potential for injury.

Bloschock noted that state Standards engineers do not meet nationally, and they may be a source of members. **Durkos** asked should we court consultants? **Bloschock**: no, if you invite them they will use state $$ to attend. There was a difference of opinion on this. **Dinitz**: we should make them customers, not members. **Yodock**: ARTBA made a presentation at our DC meeting and said that their consultant community ought to work with us. Mark will look into that.

New Standardization Areas. **Dinitz** is co-chair of the AASHTO / AGC /ARTBA Joint Committee, Subcommittee on New Technologies. He suggested to AASHTO Technology Implementation Group (TIG) that they should employ Task Force 13 to help implement new technologies. Some of the new technologies include: Prefab bridge elements, FRP

decks for small bridges, and Steel orthotropic plates. By brining new technologies to a group like TF 13 they can get us to help promote them through our guides. By having industry involved you get information on many more potentially useful products. The TIG is looking for tested technologies that they can promote, and TF13 is a great example on how to get this info out to the real world.

General Discussion Topic: MGS Barrier System:

Don Johnson of Trinity Industries wanted to present a counter view not to just the Midwest Guardrail System but to barrier innovations designed for larger size of vehicles in general. We need to consider the practicality of MGS 31 (height to top of rail is 31 inches.) The MGS uses the same 12-gage w-beam rail and standard post as current system, but the splices are located between posts, and the blockouts are deeper (12" rather than 8").

Johnson expressed some potential non - benefits to the proposed MGS system that should be considered, including:

Moving W beam splice points will require new parts meaning more panels in DOT inventories..
Larger blockouts will be more expensive due to larger trees or more plastic, etc.
Post bolts will also be longer, heavier, and more costly.
Increase in block weights will increase freight cost of shipping them.
Post offset due to longer blocks will require more grading for proper installation..
Retesting of terminals and transitions to 31 inch height will also add extra cost that must be passed onto users.
(Editors' note: After the TF-13 meeting, one of the larger guardrail producers ran a cost on MGS and estimated a 30 cent per foot increase.)

If vehicle sizes continue to go up then the MGS extra cost may be worth it. However with current high gas prices we are seeing vehicle sizes shrinking. SUVs are shrinking. Hybrid cars are in big demand. Clear trend is to smaller vehicles, and challenges our assumptions of 3 to 4 years ago that vehicle sizes would continue to increase. When pressed for specific premium cost, **Johnson** estimated the MGS premium could be as much as $1 to $2 per foot increase. He ended by saying Trinity looked forward to participating in the new requirements if adopted, but felt that for credibility, our industry needs to consider the wisdom of accommodating larger vehicles at the present time.

Faller said MWRSF looked into the costs of using the MGS and believed the price would be the same or maybe 3 percent increase. Dean Sicking and King Mac are still watching vehicle weights and they are still going up.

Hubble asked if the MGS had been crash tested in sub-freezing temperatures? **Faller** indicated that no such testing has been sponsored, to his knowledge.

Carl Ochoa: By moving the splices away from the posts and alleviating stress concentrations we can improve the strength of the rail.

Durkos: Any input from states ready to implement? **Faller**: Some states are ready to adopt the MGS once terminals and transitions are developed. MWRSF is working on transitions, but also looking at other unusual situations like over culverts, etc.

Durkos: Indicated the cost of his company's terminals for the MGS should not increase by any appreciable amount, as the cost of testing is amortized over all product cost, as was done with the terminals meeting NCHRP Report 350. Prices would not be raised to accommodate additional testing costs.

Technical Presentation

Nicholas Skrzypczak gave presentation on the Luciol delineation system. It is a continuous line of retroreflective markers that fit into the groove of a w-beam guardrail. Different colors visible on opposite sides of the road help to delineate curves. Shows significant improvement in crash performance when installed in 4 sites in Europe. Luciol is prepared to conduct MUTCD compliance testing in US.

Executive Board Meeting:

Present: Co Chairs Durkos and Collins. Chair Emeritus Dinitz. Secretary Artimovich, Alberson, Berry, Mauer, Frederick, Stephens, Faller, Longstreet, Bligh, Takach, Bloschock, Paul, Leahy, LaTurner

We need to alert world about our website. Artimovich agreed to add a link to the FHWA Office of Safety "Overview" page:
http://safety.fhwa.dot.gov/roadway_dept/road_hardware/road_over.htm

Members should be asked to "test drive" the website and send comments.

Eventually the Member Resources would be password protected, but it would be with the same username and password for all members.

Are we interested in web site hits? Can we add a hit counter?

Need to add a PDF of the membership list. Want to add photos too.

Collins asked **Roger Bligh** to discuss transitions. Current Barrier guide will be archived as is, but BR guide will not include transition hardware. A list of transitions will be included along with link to the originators. When additional funding comes along we will look into posting the details. Will keep this within Subcommittee #3 rather than the Barrier subcommittee. Since there are no proprietary transitions, there won't be anyone to do the drawings for us.

New Standardization. Need new volunteers for this. Also, what do we want to pursue? **Clarence Mabin** listed as co chair but has retired from active service. Lohrey is listed as the other co-chair but has not been an active TF-13 member.

Durkos: Executives ought to handle this as they have hand on the pulse of industry. Potential topics:

Noise walls had been looked at and dropped.

What about security barriers? Some are barriers to keep vehicles from hitting buildings; others are for shielding highway infrastructure like bridge piers. AASHTO has a security committee. DOD is security minded but is aware that they do not want to kill innocent citizens.

Traffic calming features. Context sensitive design. ITS has generated more road sensors.

What about portable concrete barrier segments? Should these be in the Barrier guide or just given to Sub #6 on Work Zones that defers to NWZSIC and FHWA.

Our fall meeting will be at Perdido Beach, Alabama, on September 19-20, 2005, near Pensacola, Florida. The AASHTO TCRS will meet September 20-23.

Spring meeting 2006. Options considered include Chicago, but cost of lodging is prohibitive. Our recent history has been to meet at a location where we can witness a crash test. Faller volunteered Lincoln Nebraska. We will also take into consideration the location of the Fall 2006 meeting being in the northeast, perhaps Toronto, Ontario, or the Delaware / Pennsylvania / New York area.

Friday, April 29, 2005 at East Liberty Ohio

John Phillips welcomed us to the TRC facility and discussed housekeeping matters including the tour and crash test.

Durkos was MC for the second day. TF 13 members attending the last two Spring meetings witnessed high speed crash tests of vehicles into barriers. Today's test will be a low speed bogie test, but we will get an in depth explanation of the vehicle monitoring electronics. **Durkos** thanked the TRC staff for their preparations, and the Co-chairs for their work on Task Force publications.

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UPDATE ON RELEVANT NCHRP PROJECTS

Chuck Niessner did his usual excellent job in summarizing the current roadside related studies. Those of you viewing the electronic version of these minutes should be able to click on the project number below and be linked directly to the NCHRP page describing the project. Otherwise you may go to http://www4.trb.org/trb/crp.nsf and look for NCHRP.

16-04	
Design Guidelines for Safe and Aesthetic Roadside Treatments in Urban Areas (Active) Revising interim report	
17-11(2)	
Determination of Safe/Cost Effective Roadside Slopes and Associated Clear Distances (Completed) Follow on contract (2) to develop guidelines is pending.	
17-14(02)	
Improved Guidelines for Median Safety (Active)	
17-22	
Identification of Vehicular Impact Conditions Associated with Serious Ran-Off-Road Crashes (Active) Working on reconstructing approximately 1000 crashes.	
20-07 (192)	
Task 192 Update of *A Guide to Standardized Highway Barrier Rail Hardware*, 1995	
20-07 (196)	
Task 196 "Development of a Guide to Crashworthy Bridge Rail Systems – Contract pending	
22-12(02)	

Guidelines for the Selection, Installation, and Maintenance of Highway-Safety Features Currently completing the benefit – cost analysis	
22-14(02)	
Improved Procedures for Safety-Performance Evaluation of Roadside Features (Active) Completion likely in the Spring 2006	
22-18	
Crashworthy Work-Zone Traffic Control Devices (Crash Testing Done) Draft final report submitted.	
22-19	
Aesthetic Concrete Barrier and Bridge Rail Designs (Active) Test plan is completed, likely to finish this summer.	
22-20	
Development of AASHTO LRFD Design Methodology and Load Transfer Mechanism for MSE Walls with Top-Mounted Traffic Barrier / Anchor Slab Under Vehicular Impact Load (Work plan submitted) Phase 1 Completed.	

Chuck also noted these projects that have been approved for FY 2006:
Project 22-21: "Median Design and Barrier Considerations for High Speed Divided Highways"

Project 22-22: "Effectiveness of Traffic Barriers on Non-Level Terrain"

Project 22-23: "Barrier System Maintenance Procedures"

Projects 22-21 and 22-22 may be combined into one project.

For more information on Cooperative Research Projects, see
http://www4.trb.org/trb/crp.nsf

AFFILIATED COMMITTEE ACTIVITIES

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Frederick: AASHTO Subcommittee on Bridges and Structures – meeting will be in Newport Rhode Island. Technical Committees discuss changes to AASHTO Design Specifications. There are four Technical Committees of Interest to Task Force 13:

T-13 Culverts,
T-12 Sign Supports,
T-11 Research,
T-7 Guardrail and Bridgerail

One NCHRP Contract of interest:
10-7 Fatigue Testing For Cantilever Designs for Sign, Luminaire, and Signal Support Structure Connection Details

Donna Clark of ATSSA: Head of Products and Training. Liaison to ATSSA Guardrail Committee. ATSSA offers guardrail installation courses and Longitudinal Barrier

Systems Training Course. Have not had much success in selling courses; so have converted them to "Webinars." See http://www.atssa.com/rsti/default.asp for more info.

The ATSSA Midyear Meeting will be held Aug 25-27. The Guardrail Committee meets on the 26th. Work Zone Awareness Week kick off was at Woodrow Wilson Bridge construction project. Work Zone Memorial Wall was present, now is 28 feet long with names of workers and motorists killed in work zone crashes. In May will do the ATSSA Fly In to Washington DC to promote passage of the highway bill, and adding in dedicated safety funding.

Guardrail Committee is putting together a "best practices" guide from around the country. **Durkos** encouraged State DOT people consider if they have any good guardrail programs in their state to contact ATSSA for inclusion.

David Brand, Madison County, Ohio, Engineer representing National Association of County Engineers. Ohio is the only state that elects its county engineers. Affiliate of NACO.

Brand outlined NACE's four prime objectives:

- To advance county engineering and management by providing a forum for exchange of ideas and information aimed at improving service to the public.
- To foster and stimulate the growth of individual state organizations of county engineers and county road officials.
- To improve relations and the spirit of cooperation among county engineers and other agencies.
- To monitor national legislation affecting county transportation/public works departments and through NACO, provide NACE's legislative opinions.

He noted that NACE also focused on highway safety. A large percentage of all crashes occur on local rural roads that are the responsibility of County Engineers. NACE is also affiliated with many other nationwide safety efforts, LTAP, and partnerships. These affiliations are important to NACE members, and members feel their input is important to these national efforts as well.

Mcdonnell of AASHTO HQ. He is the Staff Liaison to Construction and Design Subcommittees.

Reauthorization: for the last 1.5 years have been trying to enact a new highway bill. Now in 6th extension. House and Senate bills have now both passed and will now go to a conference committee. AASHTO expects another extension on May 31 and new bill in the summer.

AASHTO TCRS includes 20 members from State DOTs. They write the AASHTO RDG. Chapter 6 update on Median Barriers is proposed and the draft is to be balloted this summer. Barriers will be warranted on medians less than 50 feet wide.

Research 20-7 is proposed study Guidelines for Selection of Cable Barrier Systems.

New/Old Business

Perdido Beach Alabama September 19-20 for TF-13. (Just west of Pensacola Florida.) Members can fly into Pensacola or Mobile. AASHTO TCRS planning on the NorthEast for the FALL 2006 meeting, Toronto if US passport requirements are not in place.

Looking for volunteers for Spring 2006 meeting. Recent tradition has been to hold spring meeting near a crash test site. MWRSF, E Tech, and SafeTech. Other options are for Jackson Hole and Sarasota. A poll was taken and there was no strong interest in meeting in a location that is associated with a crash test facility.

Technical Presentations:

<u>Ron Faller: Recent crash testing at MidWest Roadside Safety Facility</u>

Ron showed a video of crash testing of the following four barriers:
1.Asphalt tie down system for temporary concrete barriers adjacent to a vertical drop.
2.Asphalt tie down between freestanding temporary concrete barrier and a rigid barrier.
3.Short Radius GR where side road intersects with mainline near bridge.
4.Bike Railing atop single sloped barrier.

Brief summary of results

1. Pins 36 in long driven thru traffic face of barrier into asphalt. Hi pitch and roll but probably OK
2. Use same tie down barrier, transitioned to rigid barrier system, connected via thrie beam on both sides of barrier. Pins to asphalt in transition, barrier is free standing approaching this area. The transition from the freestanding barrier to the barrier pinned to the asphalt was judged to be more critical than the transition from the pinned barrier to the rigid wall. Rear of pickup went over barrier. The vehicle then rotated 90 degrees after fracturing the concrete barrier and at a point when the vehicle's rear end re-contacted the barrier downstream of impact. The fractured barrier did not allow the vehicle to breach the barrier**.** High roll, pitch, and yaw. The results of this test were deemed acceptable.
3. Found need to increase tension in rail face parallel to mainline in order to pass that test. Still have many tests to run, especially on the radius.
4. SS Barrier 32 inches tall with bike-pedestrian rail atop it. Posts are bolted to the back of the wall. Engine, hood, and quarter panel snagged as the vehicle climbed up the concrete and encountered the rails. Tried adding a 4th rail, still failed.

Funding ended. The problem was that the rails constrained the vehicle's corner from rising, and the rear and off-side of truck vaulted.

Carl Ochoa Vista Engineering

Where are we going with crash testing, and with our standard W-beam guardrail systems? What do we know today? Ochoa, who in the past has developed O-Rail and O-Post, has given much thought to the performance of W-beam barrier systems. Ochoa's latest proposal is that there may be a viable way to eliminate blocks from current strong post W-Beam systems, with potential cost savings and performance improvements.

Goals: Reliability improvements for steel strong post GR systems. Address vehicle vaulting and pocketing on strong post systems. Blocks don't operate in a consistent manner to accomplish guardrail release- thus the above problems occur even with deeper blocks. Solution is a "Mini Spacer" Release Mechanism. Designed to work on both strong and weak post systems. Successfully tested to NCHRP Report test # 3-11 which is the length-of-need test using the 2000 kg pickup truck at an impact angle of 25 degrees. An 'after' photo showed the deflected guardrail beam with its w shape relatively undeformed, indicating that the system might have worked with an even heavier vehicle. Used conventional W-beam rail supported on the O-post, with the Mini Spacer to regulate release forces. No back up plates or blocks are used in this design. Ochoa states that the Mini Spacer should work just fine for W-beam on W6x8.5 posts without blocks.

Key thoughts: Present strong post W-beam systems rely on a host of relatively unpredictable mechanisms to accomplish the pull-through of the bolt head through the face of the guardrail to accomplish release. It's impossible to predict exactly which of these mechanisms will actually occur, because blocks are so sensitive to installation and crash details. For example, when a guardrail post bolt is at one end of its post bolt slot of the guardrail, the pull-through force may be about 63 percent higher than when it is more nearly centered in the slot. This and other sources of variability in release behavior related to blocks in general, result in an overall lack of consistency in release mechanism, which is a significant problem. Thus, if you eliminate blocks altogether and connect the rail to the post with a reliable and repeatable-release fastener, you may substantially improve the overall system performance. This is what Ochoa observed in his test. Maximum dynamic deflection of 31-inch high rail was 47.9 inches for 6 ft long posts. Maximum roll, pitch, and yaw angles were each less than 5 degrees, indicating stable vehicle behavior. Ochoa's patented approach may ultimately enable shorter posts or wider post spacing options for NCHRP 350 capable strong post W-beam systems, while improving system performance.

Chuck Plaxico mentioned he recently simulated a small car impact to a similar system, but had some snagging of the vehicle on posts. Ochoa said that one key problem with such simulations has been accurately representing the failure mode of each steel post in LS DYNA (Material Type 24: plasticity with strain-rate effects) versus the failure mode that may occur in actual crash tests, which is buckling- so perhaps the posts weren't

represented in every vital detail, and believes the system with the Mini Spacer may work just fine with the small car, as some historical tests have indicated.

Dave Hubbell of Composite Structural Design showed a steel barrier system that has been redesigned to accommodate an underdrain. The Systema, from Italy, was accepted in the FHWA Letter B-123.

Chuck Plaxico of Battelle described their evaluation of the Ohio DOT Type 5 GR with Tubular Backup.

Nested W beam, backed up with 8x4 box. On W6x25 posts. Can be bolted to the top of a culvert, have concrete footer, or have full depth post in soil. Phase 2 of the development and testing of this rail is underway. Phase 3 is crash testing. Ohio Box Beam BR was tested to Report 230 criteria but has not had a pickup test. In simulation, w-beam is damaged. System improvement used two tubes behind the w beam. G-forces are a little higher, but some ridedown values improve. Wheels do not get under the post to snag. It is also similar to a Texas system. Was accepted as a TL-3 system on April 7, 2005. In phase 2 they are assessing the transition section.

Rick Mauer. Marion Steel. Update on Marion Steel's Cable Barrier

Installed a 2 meter post spacing system and got a deflection less than 6 feet when use concrete sockets. Mixing socketed systems with direct drive is acceptable. Showed news footage of a median crash where father blacked out and hit median barrier. 11 accident reports have been filed but there have been 40 repair reports, indicating that most impacts are not severe enough to be the subject of a police report.