AUBURN

SAMUEL GINN
COLLEGE OF ENGINEERING

DEVELOPMENT AND PRESENTATION OF A ROADWAY AND ROADSIDE DESIGN COURSE

FINAL REPORT
PROJECT 930-622

By
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Brian L. Bowman

Highway Research Center
Auburn University, Alabama

Sponsored by
Alabama Department of Transportation
Montgomery, Alabama

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Highway Research Center
Harbert Engineering Center
Auburn, Alabama 36849

www.eng.auburn.edu/research/centers/hrc.html

ROADWAY AND ROADSIDE DESIGN
Training Course

Date	Location	Participants
May 16 – 19, 2005	Mobile	31
June 13 – 16, 2005	Montgomery	31
June 27 – 30, 2005	Guntersville	27
July 12 – 14, 2005	Montgomery	27
September 17 – 20, 2007	Montgomery	40
		156

Instructors

Robert L. Vecellio
Department of Civil Engineering
Auburn University

Brian L. Bowman
Department of Civil Engineering
Auburn University

ROADWAY AND ROADSIDE DESIGN
Training Course

Course Topics

Introduction

Basic Design Factors
- Highway Systems and Classification
- Human and Vehicle Factors
- Vehicle Speeds
- Traffic Characteristics
- Highway Capacity

Bearings, Stations, and Slopes
- Bearings and Distances
- Grades and Slopes

Horizontal Geometry
- Simple Circular Curve
- Compound Curve
- Reverse Curve
- Taper-Curve-Taper

Vertical Geometry
- Symmetrical Vertical Curve

Superelvation
- Minimum Radius of Curvature
- Transitions

Sight Distances
- Stopping Sight Distance
- Decision Sight Distance
- Passing Sight Distance

Horizontal and Vertical Alignment Design
- Horizontal Curve Design
- Vertical Curve Design

Roadside Design
- Clear Zone
- Ditches
- Guardrail Layout

COURSE OBJECTIVES

The overall goal of this course is to provide training in the elements of geometric highway design. Specific course objectives are:

- To review the geometry of horizontal and vertical alignment including simple circular curves, compound curves, tapers, and vertical curves.
- To present the concepts of highway design as presented in A Policy on Geometric Design of Highways and Streets (AASHTO Green Book, 2004) including functional classification, sight distance, superelevation, cross section elements, design standards, and controls for horizontal and vertical alignment.
- To present current information and operating practices related to roadside safety as described in Roadside Design Guide (AASHTO, 2002) including, the clear zone concept and slope design.
- To present Alabama Department of Transportation operating practices with respect to location and design elements.
- To present a typical roadway and roadside design workflow.

COURSE MATERIALS

Course materials for this training course include:

- Roadway and Roadside Design Notebook, Vecellio and Bowman, 179 pp.
- Highway Curve Geometry Manual, Vecellio and Bowman, 14 pp.
- A Policy on Geometric Design of Highways and Streets, AASHTO, 2004.

ROADWAY AND ROADSIDE DESIGN

Mobile

May 16 – 19, 2005

31 Participants

List of Participants
Roadway and Roadside Design
Mobile
May 16-19, 2005

Name	Division
Bennett, Everette R.	8
Boykin, Warren C.	8
Burroughts, Randell L.	9
Davis, Elbert T.	9
Davis, Eric B.	8
Dickinson, Damico V.	8
Driver, Elston C.	8
Dudley, Shantell J.	8
Dumas, Roderick L.	8
Ezell, John D.	8
Frazier, William A.	9
Grace, Sylvia Y.	8
Hansworth, Floyd J.	9
Hunter, Gwenda K.	9
Jackson, Melvin	9
Langham, Shaster R.	9
Lawson, Terry L.	8
Lewis, Wilbur W.	8
Manuel, Beatrice C.	9
Parvez, Masood K.	8
Patrick, Elizabeth K.	8
Reddick, Jerome A.	9
Richardson, Robert J.	8
Sellers, Deandrea S.	8
Stallworth, Brenda G.	8
Steele, Germaine O.	8
Steele, Keith L.	8
Tompkins, Donnell J.	2
Wiffen, Lakisha D.	8
Wilson, Beverly M.	8
Wright, Melvin J.	8

COURSE EVALUATION SUMMARY
ROADWAY & ROADSIDE DESIGN

Mobile, AL

May 16-19, 2005

1. Will the prepared course materials serve as useful references?

	Yes	Some	No
Geometric Design Notebook	26	3	0
Highway Curve Geometry Manual	27	2	0
Problems and Solutions	26	3	0

2. Do you now have a better understanding of the Green book and ALDOT's geometric design procedures? 15 14 0

3. Please identify those topics which should be added or discussed in more detail.

Curves	Equations
Curve geometry	Problems and solutions
Vertical curves (3)	Little bit more on computer software
Horizontal curves	All
Deflections	Most were covered well
Bearings	Everything was in good detail

4. Please identify those topics which should be reduced or eliminated.

None (3)

5. Were your interests, prior skills and job responsibilities compatible with the course material and training objectives?

26 Yes
4 No

6. Were you given adequate opportunity to ask questions and get satisfactory answers?

29 Yes
0 No

7. Please provide a numerical rating for each of the following using a scale of 1 to 5 (1 = Very Poor, 5 = Excellent):

Geometric Design Notebook	4.6
Highway Curve Geometry Manual	4.6
Clear Zone and Barrier Design	4.6
Problem Workshops	4.6
Instructors	4.8
Overall Course	4.6

8. What topics do you recommend for a follow-up (advanced) geometric design course?

Advanced geometric design	Everything about curves
Combination of In-Roads and geometric design	More work with the curves
Guardrail design	More of the same
Turn design	

9. Did you benefit from attending this course? Explain.

Yes - I am a PCET and will experience much of this material once I advance through my career of civil engineering. This course has made me more excited about becoming a civil engineer.

Yes - It covered material that I had not gotten training in prior to working in design.

Yes - This class gave me a better understanding of roadway design.

Yes - A lot. I knew a little bit but know more now.

Some - A better understanding of roadway design.

Yes - I didn't have the insight on guardrails and curves as I do now.

Yes - Some situations were explained in detail that I didn't get in a similar class.

Yes - I learned a lot about the Green Book.

Yes - A little.

Yes - Good instructors.

Yes - It was very helpful, but just not enough time allotted for the course.

Yes - It gave me a better understanding of roadway design.

Yes - I now acknowledge the importance of properly installing components of the highway.

Yes - I have a much better understanding of roadway design and construction.

Yes - Better understanding of roadway design. Enjoyed.

Yes - I now understand more about the placement.

Yes - I got a better understanding of the design process, to do my job better when drawing up a paving job or surveying.

Yes - Knowledge of the Green Book.

Yes (2)

10. Other comments.

Nice class. Need more time to absorb all material.

There was a lot of information to consume in a short period of time. There was not enough time to "learn" equations and concepts.

Everything was good.

Very good. But the participants need to be more behaved.

This was a very informative and valuable class.

Room temperature was very uncomfortable. It's hard to concentrate when you're focused on keeping warm.

Visual aids were very clear and understanding. Instructors were very knowledgeable and professional.

Bob Vecellio and Brian Bowman did an outstanding job of explaining the materials.

ROADWAY AND ROADSIDE DESIGN

Montgomery

June 13 – 16, 2005

31 Participants

List of Participants
Roadway and Roadside Design
Montgomery
June 13-16, 2005

Name	Division or Bureau
Bonner, Lisa L.	Transportation Planning
Brown III, Willie C.	Materials & Tests
Burt Jr., Arthur E.	Materials & Tests
Christian Jr., Henry L.	Division 8
Clay, Lashaundra P.	Multimodal Transportation
Covington, Shirley A.	Division 4
Davis, Michael	Division 7
Dozier, Derwin E.	Division 4
Ford, Damon D.	Maintenance Bureau
Gillis, Michael	Design Bureau
Greene, Patricia A.	Materials & Tests
Gresham, Robert	Design Bureau
Hampton, Creola E.	Bridge Bureau
Hare, Janice Marie	Transportation Planning
Hatch-Clark, Irma N.	Division 6
Hendking, Lemiracle D.	Design Bureau
Hinton, James H.	Division 7
Jenkins-Watson, Shevette	Design Bureau
Murrell, Jefferey Bruce	Division 8
Prewitt, Tyra D.	Division 5
Rhone, Yulondra A.	Division 8
Ross, Wanda	Division 5
Thomas, Darlean	Division 7
Timmons, Jimmy L.	Division 6
Trone, Calressia L.	Materials & Tests
Tyson, Randy K.	Division 6
Waters, Lanetrica E.	Transportation Planning
Wesley, Tracey M.	Division 5
Wesley, Vincent D.	Division 5
Woodson, Kelvin D.	Transportation Planning
Wrenn, Vada Tyee	Design Bureau

COURSE EVALUATION SUMMARY
ROADWAY & ROADSIDE DESIGN

Montgomery, AL
June 13-16, 2005

1. Will the prepared course materials serve as useful references?

	Yes	Some	No
Geometric Design Notebook	26	3	0
Highway Curve Geometry Manual	25	4	0
Problems and Solutions	21	7	1

2. Do you now have a better understanding of the Green book and ALDOT's geometric design procedures? 17 10 1

3. Please identify those topics which should be added or discussed in more detail.

Curves	Hands-on for the InRoads application
All topics concerning curves	More problems/solutions
Horizontal geometry	Formulas
Vertical geometry	All
Clear zone (more discussion)	All topics need to be discussed in more detail.
Clear zone and barrier design	None (2)
(more discussion)	More slides
Traffic characteristics: AADT, ADT,	More time allowed for the class
PHF, DHV	There is a lot of information to be given in 4
Freeway flow curve	days. The calculations for vertical and horizontal
Superelevation	curves could be discussed more (for those that
Cross slopes	are not familiar).
Sight distances	I think the instructors did an excellent job cover-
	the materials in the notebook and manual. They
	covered more than adequate enough material in
	this course.

4. Please identify those topics which should be reduced or eliminated.

ADT	Math problems should be clearer
PHF	None (3)
Traffic characteristics	Should never have a test on material. It's not
Formulas	long enough.
High speeds on urban streets	I think everything is great the way it is. They
	should keep it the same.

5. Were your interests, prior skills and job responsibilities compatible with the course material and training objectives?

20	Yes
9	No

6. Were you given adequate opportunity to ask questions and get satisfactory answers?

26	Yes
1	No

7. Please provide a numerical rating for each of the following using a scale of 1 to 5 (1 = Very Poor, 5 = Excellent):

Geometric Design Notebook	4.2
Highway Curve Geometry Manual	4.2
Clear Zone and Barrier Design	4.1
Problem Workshops	4.3
Instructors	4.5
Overall Course	4.2

8. What topics do you recommend for a follow-up (advanced) geometric design course?

Curves	Road safety
Highway curve geometry (2)	Superelevation design
Horizontal geometry	Clear zone and barrier design
Vertical geometry	Geometry for establishing bridge
Horizontal and vertical alignment	elevations
Topics about curves	Microstation
Sight distance	Advanced geometric design
Stopping distance	All
Guardrail	None (2)
Ditches	I recommend all because you don't have
	have enough time. You need more than
	4 days.

9. Did you benefit from attending this course? Explain.

Yes - It has been a long time since I calculated curves. This was an excellent refresher. The design information was a plus.

Yes - I have benefited greatly from attending this course. I work in Roadway Design, so all of this information covered in this course will aid me in working on various projects in my department.

Yes - I have more understanding in general about roadway design and slopes.

Yes - I didn't know this much what for to building things.

Yes - This course was a great refresher of previous coursework taken in college.

Yes - Because I was able to get a better understanding of horizontal and vertical curves.

Yes - I've learned things that I didn't know.

Yes - I have a better idea of what roadway and roadside design encompasses.

Yes - Better understanding of road design; more attention to detail.

Yes - I benefited a little because I survey daily, so I understand a little about what's going on.

Yes - It gave me a better understanding of roadway designs.

Yes - I have a better understanding about roadways and what it takes to design a road.

Yes - I now have a much better grasp of superelevation transition.

Yes - I learned things that I never totally knew.

Yes - The information was very helpful.

Yes - I learned more about ideas I wasn't very sure of. Thanks.

Yes - The course enlightened me on roadway design. I have a better understanding of the design of the highways.

Yes (3)

10. Other comments.

This was an excellent course. I wish they would offer it earlier - when new graduates and new employees come on with DOT. They should be required to take this course within the 1st month of employment.

More videos would be a positive.

Need more updated videos. Need more problem workshops.

This course needs to be much longer!! (at least two weeks).
The course was good but you need more time. It's just not long enough.

Lunch should be provided.

None

ROADWAY AND ROADSIDE DESIGN

Guntersville

June 27 – 30, 2005

27 Participants

List of Participants
Roadway and Roadside Design
Guntersville
June 27-30, 2005

Name

Alexander, Penny G.
Blackburn, Rashad L.
Brown, Willie E.
Crosby, Tametris L.
Elliott, Arthur B.
Ellis, Ronnie N.
Fuller, Angelia L.
Gholston, Ronald M.
Hubbert, Curt
Johnson, Brandon
Johnson, Shirina D.
Jones, Horace C.
Key, Audrey A.
King, Robert E.
Mathews, Stephanie L.
McCollum, William B.
McGhee, Howard
Mosley, Zachery D.
Nene, Nicholas T.
Nero, Reginald Leonard
Parks, Ronald B.
Sims, George E.
Stevenson, Nathan D.
Stewart, Kelvin A.
Taylor, Tiayon T.
Wade, Willie E.
Woods, Madelina Rem

COURSE EVALUATION SUMMARY
ROADWAY & ROADSIDE DESIGN

Guntersville, AL
June 27-30, 2005

1. Will the prepared course materials serve as useful references?

	Yes	Some	No
Geometric Design Notebook	23	2	0
Highway Curve Geometry Manual	24	1	0
Problems and Solutions	23	2	0

2. Do you now have a better understanding of the Green book and ALDOT's geometric design procedures? 11 11 3

3. Please identify those topics which should be added or discussed in more detail.

Curve data	Surveying
Curve geometry	Superelevation (2)
Horizontal and vertical curves (2)	Superelevation design
Highway curve geometry	Sight distances
Highway curve problems and solutions	Have more problem solving
Horizontal curves - more in-depth	More time to train
Vertical curves - more in-depth	The entire class should be more than
Vertical curves and drainage	four days.

4. Please identify those topics which should be reduced or eliminated.

Ditches
None (3)

5. Were your interests, prior skills and job responsibilities compatible with the course material and training objectives?

25 Yes
0 No

6. Were you given adequate opportunity to ask questions and get satisfactory answers?

24	Yes
0	No

7. Please provide a numerical rating for each of the following using a scale of 1 to 5 (1 = Very Poor, 5 = Excellent):

Geometric Design Notebook	4.6
Highway Curve Geometry Manual	4.5
Clear Zone and Barrier Design	4.4
Problem Workshops	4.5
Instructors	4.7
Overall Course	4.5

8. What topics do you recommend for a follow-up (advanced) geometric design course?

Bearings	Using software to determine concepts
Curve data	Computers in workshop
Highway curve geometry	All
Horizontal and vertical curves	All of them
Traffic control and safety	More time, more than 4 days
Possible field work to determine concepts learned	

9. Did you benefit from attending this course? Explain.

I've benefited by learning some valuable information on roadway design that will help in the future with microstation.

I increased my ability to read plans in numerous ways and to calculate various formulas.

Yes - It made me more aware of safety issues.

Yes - I learned a lot I did not know because of a lack of any prior experience.

Yes - I got a better understanding of how curves and roadways are designed.

Yes - I now have a better understanding of what is considered in a job layout.

Yes - The entire training class was enlightened and educational.

Yes - It taught me more about guardrail and other areas in safety.

Yes - More of an insight of elements of design on a national level.

No - The instructors didn't have enough time to teach all the material that was covered.

Yes - Because of the vast amount of topics that were covered and explained thoroughly, I can now feel more comfortable around the personnel from the division and the design bureau when they are discussing problems on our projects in construction, especially roadway projects.

Yes - I understand more about how to use bearings and how to use the various charts to get the information on how to design a ditch or determine if the design is in accordance with the green book.

Yes - One day I hope to use what I learn if I'm given the opportunity.

Yes - It gave me a review of past materials I had studied and enabled me to learn new details within the topic.

Yes - It gives me a better understanding of how and why's of the roadways.

Yes - Students should have all math before this course. You are at a loss without it.

Yes - A better understanding of ditch design and guardrail placement and how they work.

The class was very informative and I got a lot out of this class. But the class was just not long enough for all the information.

Yes, I did. I can now put some of my on-the-job training with the information that we learned and have a better understanding. I do suggest that the course should be a little longer because when they are teaching they are assuming that you know what they are talking about and assuming that you recognize the problems. The course should be taught as if everyone is on the same level. Then if they get it and want to move on to something else or speed-up then, so be it.

Yes (2)

10. Other comments.

The course was very good. I think this course should be offered to more personnel in construction, especially in project offices in the field. The instructors made sure that our concentration remained on the subjects. They kept our attention and the information they passed on flowed smoothly as the course progressed.

All in all, I became more aware of what goes on in the process of designing roads and the various aspects of roadways.

It takes time for some to learn.

The roadway design manual was very good and easy to follow. I would recommend that in the future, you provide step by step solutions (step by step printed-out solutions) at the end of each workshop for the questions given. This would enable someone if they were reviewing their notes at a future date.

Why was there no lunch or coffee offered to this class? I will monitor future classes and send a letter to the proper people and let you tell them why no lunch, or no coffee or water was offered.

Mr. Bowman is a very good instructor making sure we have an understanding of material covered before moving on.

Both instructors, Mr. Vecellio and Mr. Bowman, took the time to explain the topics that we did not understand!

ROADWAY AND ROADSIDE DESIGN

Montgomery

July 12 – 14, 2005

27 Participants

List of Participants
Roadway and Roadside Design
Montgomery
July 12-14, 2005

Name	Bureau/Division
Anderson, Walter	Division 5
Chapman, Marquette	Division 5
Guin, Kevin	Design Bureau
Hampton, Wanda N	Division 5
Heard, Davie C	Division 5
Hollingsworth, Jeffery L	Division 6
Howard, James D	Division 4
Jarrar, Hesham J	Design Bureau
Jayroe, John S	Division 9
Jefcoat, Jr., William C	Division 6
Johnson, Margaret	Division 2
McCallum, Kenneth	Maintenance Bureau
Pearson, Curtis J	Design Bureau
Pruitt, Bobby A	Division 2
Rackley, Darin D	Division 5
Randolph, Florence M	Division 2
Reed, Jr., Michael J	Design Bureau
Rodgers, Selena A	Division 3
Shaw, Eric Tyeast	Division 4
Shields, George W	Division 6
Smith, Calvin L	Materials & Tests
Smith, Vivian E	Division 6
Spears, Darryl	Transportation Planning
Thomas, Terence D	Division 5
Turner, Shakia R	Division 5
Wallace, William L	Division 5
Williams, Jennifer L	Division 2

COURSE EVALUATION SUMMARY
ROADWAY & ROADSIDE DESIGN

Montgomery, AL
July 12-14, 2005

1. Will the prepared course materials serve as useful references?

	Yes	Some	No
Geometric Design Notebook	23	3	0
Highway Curve Geometry Manual	23	3	0
Problems and Solutions	18	7	1

2. Do you now have a better understanding of the Green book and ALDOT's geometric design procedures? 19 | 7 | 1

3. Please identify those topics which should be added or discussed in more detail.

Bearings, stations and slopes	Pavement rehabilitation
Formulas for stations	Structural/bridge design
Horizontal curves	All of them
Vertical curves	All topics in more detail
Horizontal and vertical geometry	All, especially curve geometry, sight
Formulas for curves	distance and computer design.
Superelevation	All formulas confusing.
Minimum radius of curves	The geometric design notebook. We need
Sight distance	more time for this class.
Stopping sight distance	Need a little more information on grading
Methods for determining ADT	the roadway and roadside, and
Basic design factors	barrier devices for inspection.
Roadside design	The class itself should be a little longer.
Pavement design	Length of total time.
	Well, all the topics that Bob Vecellio
	taught. Brian Bowman topics were
	taught very well.

4. Please identify those topics which should be reduced or eliminated.

5. Were your interests, prior skills and job responsibilities compatible with the course material and training objectives?

20	Yes
6	No

6. Were you given adequate opportunity to ask questions and get satisfactory answers?

26	Yes
1	No

7. Please provide a numerical rating for each of the following using a scale of 1 to 5 (1 = Very Poor, 5 = Excellent):

Geometric Design Notebook	3.9
Highway Curve Geometry Manual	4.0
Clear Zone and Barrier Design	4.0
Problem Workshops	4.1
Instructors	4.3
Overall Course	4.0

8. What topics do you recommend for a follow-up (advanced) geometric design course?

Geometric design	InRoads
Horizontal curve geometry	None
Vertical and horizontal design applications	Not too sure All
Superelevation	Everything
Clear zone	Yes
Barrier design	
Microstation/InRoads - just basic design of various sheets from concept, including surveying to adjusting for variable specifications and/or site specifics.	
Preview of new software used for geometric design or introduction into the future of geometric design.	

9. Did you benefit from attending this course? Explain.

It was too much material in too little time.

A little, the class was too short. They try to pack the information in and you can't retain it all.

Honestly, not a lot because of lack of experience in this area. However, I did enjoy the clear zone and barrier design portion.

Some, but I've never had geometry so it was somewhat difficult.

Yes - This class enhanced my overall perspective of geometric roadway design. It allowed me to further actualize the concepts by refreshing what I had forgotten and emphasizing what I was not as familiar.

Yes - Clear zone application for various pole (hazard) locations - guardrail videos - reactions design.

Yes - I learned more about how roads are designed and why they are designed that way.

Yes - Cause it helped me prepare for my geometry class.

Yes - Better understanding of geometric principles.

Yes - I've got a better understanding of things to look for when inspecting.

Yes - Good mix of historical significance and explanations. Good pace. Good job of amending tables in figures. Very "user friendly."

Yes - Class was exposed to the entire process from survey to plan sheet.

Yes - Refresher for PE exam.

Yes - Math skills get dull if unused.

Yes - It made me aware of roadway design, overall goal in geometric street and highway design as related to roadside safety, including the clear zone concept and slope design and roadside design workflow.

Yes (6)

10. Other comments.

Class reduced to 3 days and 3 hours due to weather.

Course needs to be more days. This course has a lot to offer but needs to be longer.

Requires more time, at least 4 weeks.

Class needs to be longer. We went over some of the figures too fast.

Class needed to be a little longer. Some of the equations took a little more time to understand, which took time away from other parts of the lesson.

The class seemed to have been rushed and some issues could not be discussed in detail.

If you are going to give the class, at least give people the time to get the class. 3 or 4 days are not enough time to get this class.

Couldn't concentrate - room like a deep freeze. Fellow co-worker and attendee...given the whole 3 days. Instructors could have said something.

80% of the people in the class had no interest in being here. They were disruptive and rude. Those of us interested in the class had a difficult time hearing the instructors.

None

No comments.

This was a lot to take in, in this short period of time.

It is not fair. I think that the teachers did a wonderful job with the information they had considering the length of time given. Seven o'clock is too early to start a class.

Instructors were interesting, personable and very knowledgeable.

Possibly there should be a prep class before this. The manual could be more user friendly. I thoroughly enjoyed Mr. Bowman. He is an excellent teacher.

The instructors were excellent and well prepared. The flow of this lecture was impactful and the problems presented were challenging. If there were future classes in these areas, I would be interested in either.

ROADWAY AND ROADSIDE DESIGN

Montgomery

September 17 – 20, 2007

40 Participants

List of Participants
Roadway and Roadside Design
Montgomery
September 17-20, 2007

Name	Bureau/Division
Abrams, John L	Division 5
Allison, Avery V	Division 9
Beaird, Paul B	Design Bureau
Biddick, Kimberly K	Design Bureau
Brooks Jr, Charlie C	Design Bureau
Bryant, Alan E	Division 7
Burgess, Lillie J	Division 5
Bush, Charles D	Division 7
Carr, Ronnie	Division 7
Cooper, Jimmy L	Design Bureau
Dixon, Kidada C	Research & Development
Donaldson, Patricia	Division 3
Dunn, Adriana L	Division 3
Dunn, Heather M	Design Bureau
Franklin, Charlotte A	Division 7
Gillis, Michael	Design Bureau
Gray II, Robert E	Design Bureau
Griffin, Steven M	Design Bureau
Hall, Connie B	Design Bureau
Harris, Robert A	Design Bureau
Henley, Aisha S	Design Bureau
Hughes, Wendy G	Division 7
Jenkins, Samuel	Design Bureau
Jones, Robert B	Design Bureau
McGhee, Howard	Division 3
McQueen, Alfred L	Design Bureau
McWhorter, Derick	Design Bureau
Naranjo, Freddy A	Design Bureau
Odom Jr, Philip L	Design Bureau
Parks, Ronald B	Division 1
Perkins, Christopher	Division 5
Powell, John W	Design Bureau
Prince, Steven M	Design Bureau
Proulx, Taylor G	Design Bureau
Rodman, Terry E	Design Bureau
Sanders, Jeannette V	Division 7
Williams, Leroy	Design Bureau
Wood Jr, Charles L	Division 1
Woodson, Kelvin D	Design Bureau
Zhang, Xiyan	Research & Development

COURSE EVALUATION SUMMARY
ROADWAY & ROADSIDE DESIGN

Montgomery, AL
September 17-20, 2007

1. Will the prepared course materials serve as useful references?

	Yes	Some	No
Geometric Design Notebook	38	1	0
Highway Curve Geometry Manual	38	1	0
Problems and Solutions	35	4	0

2. Do you now have a better understanding of the Green book and ALDOT's geometric design procedures? 31 | 7 | 0

3. Please identify those topics which should be added or discussed in more detail.

Highway Curve Geometry	More highway capacity and level of service
Formulas	More superelevation
Inroads applications	More sight distances
All of them	Slopes - front, back
Content is adequate	Slopes in general
Seemed good	Guardrail (2)
Vertical curve geometry	Horizontal curve geometry
I think it is pretty well put together.	
Where to locate specific items in the Green book	

4. Please identify those topics which should be reduced or eliminated.

All of the topics were beneficial.

All are needed.

Seemed adequate.

I think it is pretty well put together.

5. Were your interests, prior skills and job responsibilities compatible with the course material and training objectives?

36	Yes
1	No

6. Were you given adequate opportunity to ask questions and get satisfactory answers?

37	Yes
1	No

7. Please provide a numerical rating for each of the following using a scale of 1 to 5 (1 = Very Poor, 5 = Excellent):

Geometric Design Notebook	4.6
Highway Curve Geometry Manual	4.6
Clear Zone and Barrier Design	4.4
Problem Workshops	4.5
Instructors	4.8
Overall Course	4.5

8. What topics do you recommend for a follow-up (advanced) geometric design course?

All topics

Seemed adequate

Whatever that's available

Horizontal curve design

Vertical curve design

Highway capacity - weaving, lane closures for construction

Highway capacity - signalization, determining capacity, additional lanes

Stopping sight distance - accident analysis, design of acceleration and deceleration lanes

Guardrail

Computer applications

Software applications, especially for superelevation

Related topics using CAD

None - just split up the material so we can keep up a little better

Any topic used by ALDOT

9. Did you benefit from attending this course? Explain.

Yes - My understanding gets better each time I take this course. This course should always be used as a refresher.

Yes - This class gave me a better understanding of how lead designers arrive at roadway design computations such as gradients, ditch slopes and vertical curves.

Yes - I understand guardrail sections. I was having problems with some guardrail jobs and this course explained the problems I was having.

Yes - I have a better understanding of roadside design.

Yes - I am a designer.

Yes - This material will be helpful to me in my line of work.

Yes - I did benefit from taking this course. Bearings, stations, slopes and horizontal and vertical alignment were definitely explained. And how certain areas were calculated on a job I had previously done, but someone else started. I also better understand clear zones.

Yes - This course has given me a better understanding of how to read some of the tables in the Green Book and also has shown me how those tables were created.

Yes - Enjoyed class.
Yes - Knowledge, and No - Work necessity, I'm in ROW.

Yes - Seemed adequate.

Yes - I learned a lot that will benefit my work in the transportation field.

Yes - The course was very helpful. With it, I can check plans more extensively. Thank you very much.

Somewhat - I had enough prior knowledge of prerequisites to comprehend some of the geometric design criteria.

Yes - The basics were covered well. It was in layman's terms.

Yes - I haven't had any fundamentals of geometric design until now, and it was different.

Some

Yes - A good review for the FE and PE exams.

Yes - I got a better understanding of what the computer does for us.

Yes - When I was in school, it was "theory" to me. This course with the help of the instructors and my experience at work made it easier to understand the "real world" applications.

No - It was just too fast and too short.

Yes - Very much.

Yes - I learned a little bit more about guardrail and ditch design.

Yes - I learned the use of the tables and an easy notebook for usefulness.

Yes - It furthered my knowledge of the transportation field dealing with geometric design.

Yes - As a GCE, all the material presented wasn't part of my everyday work assignment. Some of the terms and calculations were known prior to attending course. Therefore, some knowledge was gathered by attending this course.

Yes - This class gives me a more broad idea of roadway design.

Yes - I did. Being my first Geometric Design class, I was very impressed with the amount of information I received. This will help me with daily activities on my job.

Yes - This was a great review and way for me to brush up on design. This has been the most informative class I have taken since working with the state.

10. Other comments.

Both Dr. Bowman and Dr. Vecellio did an excellent job covering the material and presenting it in a timely manner. Overall, I thoroughly enjoyed the course - especially to those planning to take the Professional Engineer exam.

One of my best classes offered by ALDOT!

The overall course was very well taught by both instructors. I really enjoy Brian Bowman, not only his teaching but his humor as well. Great class.

Classes are always not long enough. This should be done in semesters, not days. It is a lot to retain in 4 days. Thanks.

The instructors (both) added to the quality and enjoyment of the course.

Very good for review class or a beginner's class. Mr. Vecellio and Mr. Bowman which I will refer to as Bob and Brian. These gentlemen know the material and have a great deal of teaching experience. The class couldn't have had a better pair. Time could be added to conceive the principal knowledge of the course.

Within these classes, there are a vast array of knowledge and practical experience concerning the various topics discussed. Non-degree in civil engineering students are at a great disadvantage. There needs to be more prerequisite courses offered for the beginning student in geometric design. They should not be in this class with those with civil engineering degrees.

This is a college level course, which should be much longer. OK.

Great class.

The course was excellent. However, it seemed that the problem solving went into overtime. The entire course appears to be able to be completed in 3 days instead of 4.

Great instructors - War Eagle!

I think more time could be given to the curve (horizontal) calculations.

I thought it was a good job. Good preparation for the P.E. Exam.

All together a great learning experience but we need a pot of coffee in the morning.

Like I said, this is a lot of material to cover and we only have 4 days. I think it would benefit us if either we had less material to cover or more time to cover it.

Needed to be offered more.

Thanks for the opportunity.

This course should be offered at least once a year to keep young and old engineers active on their jobs. In return this benefits ALDOT.

Thank you! War Eagle!

Need more time to do problems and understanding.

I enjoyed the class, found it very informative. The instructors were patient and explained in detail all aspects of the course. I needed the course.

APPENDIX

Example of Training Certificate

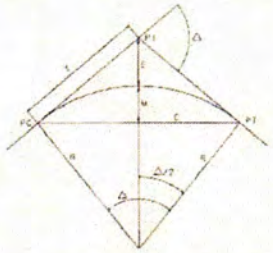
Auburn University
Highway Research Center

This is to certify that

John Roads

has successfully completed
four days of training in

Roadway and Roadside Design
September 17-20, 2007



Instructor

Instructor