OTEField

Merry Christmas and a Happy New Year

December 2010

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YOUR NEW 2010-2011 OTEA BOARD OF DIRECTORS

From Left to Right: Stuart Chai - President, James Montgomery - Director, Charlie Lee - Director, Don Russell - Vice President, Michael Hofener, Director, Angelo Lombardo - Secretary/Treasurer

Inside

ENGINEER DIRECTORY

A MESSAGE FROM THE PRESIDENT

Thanksgiving Day has passed but there is always much to be thankful for.

Amongst the many blessings of this life, too many of which I have a tendency to take for granted, I am very thankful for a thoughtful and supportive OTEA board.

The efforts of OTEA's board are currently focused on the upcoming spring meeting. We are presently looking at May 4-6, 2011, for our next gathering. Our goal is to produce a meeting that is relevant to the various roles that we, as members of OTEA, play in the support and development of the communities in which we live and work. As an engineer, I have a tendency to delve into technical matters. I am, however, also keenly aware of the needs of the "laypersons" in the interrelated and interlaced traffic and transportation fields. With this in mind, we as your board are working to provide you with subject matter at this conference that is real and relevant to your work.

If you have a topic that you'd like to see addressed, please let me or any one of your board members know. This conference is for you, after all. Providing you with a spring meeting that is successful in meeting your needs is essential. Providing meaningful program content is one means by which we can achieve this. I have provided my contact information below if you'd like to send me your thoughts on topics and/or suggestions for the spring meeting.

If you have any suggestions relative to program format, entertainment, opportunities to network with other members, etc., please send those to us as well. I personally know that there are more members that I don't know than I do know. I'd like to see it the other way around. The strength of OTEA and the purpose of its existence is to help all of its members grow professionally and to provide them with an opportunity to develop relationships with the other members of the organization. Ultimately, we all face the same issues, just in different locations and under different circumstances. Why we should have to "go it alone" and work without the benefit of the experiences and knowledge of fellow members is something that I believe needs to be changed.

I wish you all a Merry Christmas and a Happy New Year and we, as your board, look forward to hearing from you regarding the upcoming spring meeting.

Work Zone Training Class

February 2-4, 2011

Moore Norman Technology Center
Room A-200
4701 12th Avenue NW, Norman, OK 73069

See Registration Form on Page 13

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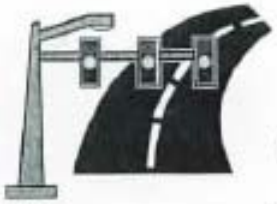

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Annual Meeting

The 2010 Spring meeting was held in southern Oklahoma's Lake Murray State Lodge. The golf tournament was held in the Lake Murray Golf Course under beautiful weather conditions. It was sunny, with no wind and temperatures in the 70's. A perfect day in Oklahoma! Twelve teams with a combined forty eight players competed in the four-player scramble tournament. Congratulations to the winning team of Jeremy Fields, Greg Heitpas, Daniel Humphrey and Tammy Robinson who scored a 10 under par 60. Second place, on a score card play-off, went to Randy Barth, Ashley Hawkins, Tim Porch and Brian Taylor, with a seven under par 63. Third place went to Brian Glover, Steven Johnson, Charlie Lee and Howard Rife also with a seven under par 63 score. Closest to the pin winners were Richard Johnson (Hole No. 12) and John Thomas (Hole No. 14) and long drive went to Jeremy Fileds (Hole No. 18). Special thanks to the various companies who helped sponsor the Golf Tournament and to Marty Pinkley who once again worked the logistics and made all the arrangements!

The afternoon was capped off with the first ever OTEA dinner cruise. Attendees loaded two house boats and cruised Lake Murray while enjoying the good company, a cold beer and the wonderful barbeque meal prepared by the "Pelco Products Chefs" - Steve Pardhun, Bob Magness and the rest of their gang. A wonderful evening indeed cruising the lake while watching the sunset …

Once again we enjoyed a tremendous level of support from many of our meeting spon-

(Continued on page 20)

Thanks to our OTEA

Annual Meeting Sponsors

The following companies donated funds and purchased booth space during our annual meeting. Their contributions and continued support help offset the cost of our meeting. It is through this support that we are able to maintain a relatively low annual membership fee and meeting registration cost. Please thank them and consider patronizing their businesses.

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OTEA AWARDS UNIVERSITY SCHOLARSHIPS

In 2006, the OTEA Board of Directors approved the establishment of a scholarship program to recognize outstanding Oklahoma civil engineering students. Every year, students from the University of Oklahoma and Oklahoma State University have the opportunity to apply for one of the three $1,000 scholarships awarded on an annual basis.

President Harold Smart presenting one of the 2010 OTEA Scholarships to OSU Senior Trenton January

This year, OTEA received six applications (four from OU students and two from OSU students). Applications were reviewed by members of a selection committee headed by Mark Brown – 2009–2010 Past President. The committee included Kristine Spence and Doug Duke.

President Harold Smart presenting one of the 2010 OTEA Scholarships to OU Senior J.D. Christiansen

Recipients for 2010 are J.D. Christiansen, a senior at the University of Oklahoma, Marc Breidy, a graduate student at the University of Oklahoma, also

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State Wide Striping Contract Available to Oklahoma Municipalities

By James Montgomery, ODOT

Missing pavement markings, pavement markings look dull, pavement markings damaged by snow plows, pavement markings look old, pavement markings do not reflect at night. Sound familiar? These are some of the conditions that indicate that pavement markings should be replaced on highways and streets. Yet most municipalities, school districts and counties can not replace damaged or missing pavement markings due to budgets. However, there is a way to replace those missing or damaged pavement markings at a reasonable cost.

The Oklahoma Department of Transportation has a statewide striping contract that the Department uses to restripe State highways. The prices for striping on the contract are lower than the average statewide letting prices for striping. The contract allows municipalities, school districts and counties to use the statewide contract to restripe their roads. The contract has items for paint, thermoplastic and multi-polymer stripe. The question is which one do you use? The Department has developed a policy for which type of stripe to use on either concrete or asphalt.

Table 1 shows when to use multi-polymer stripe:

MULTI-POLYMER STRIPE POLICY

Partial Controlled Access Facilities (2 lanes or more)

Concrete Surfaces	4" white lane lines 4" yellow and 4" white edge lines

2 Lane Highways

Concrete Surfaces	4" yellow center lines 4" white edge lines

(Continued on page 12)

2010 Semi-Annual Report to MOVITE

Oklahoma Traffic Engineering Association

TO : MOVITE Board of Directors

FROM : Stuart Chai, P.E., 2010-2011 OTEA President

DATE : September 29, 2010

RE : Oklahoma Traffic Engineering Association (OTEA) recent activity summary

The following individuals comprise the 2010-2011 OTEA Board:

President	Stuart Chai, P.E., City Traffic Engineer, City of Oklahoma City
Vice-President	Don Russell, P.E., Russell Engineering Co.
ODOT Director	James Montgomery, P.E., ODOT
City/County Director	Charlie Lee, City of Edmond
Consultant/Contractor/ Supplier Director	Michael Hofener, P.E., Traffic Engineering Consultants
Past President	Harold Smart, P.E., Chief Traffic Engineer, ODOT
Secretary/Treasurer	Angelo Lombardo, P.E., City Traffic Engineer, City of Norman

The OTEA held it Spring Meeting on May 5-7, 2010, at Lake Murray State Lodge in Ardmore, OK. Topics presented at the meeting included sign maintenance, especially with regard to new Federal retroreflectivity requirements, and a review of some of the changes in the 2009 MUTCD. The chapter set a new meeting attendance record with 168 registrants. Current membership stands at approximately 178 members. Past President Harold Smart had stressed outreach to counties and other public agencies typically not represented at OTEA meetings and as a result, with assistance from Charlie Bond, 30 people from county agencies who had not attended OTEA meetings in the past were at the spring meeting. This was a tremendous achievement.

The current slate of board officers were elected at the spring meeting.
In the past year, the OTEA chapter awarded three scholarships. Two were given to engineering students at the University of Oklahoma to Marc Breidy and J.D. Christensen and one to an engineering student at Oklahoma State University, Trenton January. All of these recipients are in their junior year or later and are taking coursework in transportation-related engineering fields.
OTEA membership has worked in support of the current MOVITE board in assisting with preparations for the fall meeting.
The OTEA board's efforts will shortly be devoted toward planning the chapter's spring technical meeting, which is a one day meeting focusing on a wide variety of transportation issues of importance to the membership.

OTEA Treasurer's Report

October 31, 2010

CD's (2):	$42,833.22
Checking:	$47,021.60
Total Assets:	$89,854.82

MOVITE Section News

MISSOURI VALLEY SECTION

RECEIVES SECTION ACTIVITIES AWARD FROM THE INSTITUTE OF TRANSPORTATION ENGINEERS

VANCOUVER, BC—The Missouri Valley Section received the Section Activities Award at the Institute of Transportation Engineers (ITE) 2010 Annual Meeting and Exhibit, held August 8–11, in Vancouver, BC, Canada.

Presented to the Missouri Valley Section in recognition of the overall program of services offered in the areas of section membership involvement, financial management, legislative and meeting/technical activities and student mentoring.

Initiated in 1992, the Section Activities Award is designed to encourage and promote active involvement by ITE sections in activities promoting the purpose and objectives of ITE. Award recipients are recognized for the overall quality of section activities, such as technical meetings, technical committees, technical reports, seminars, training programs, student participation, career guidance, membership campaigns and public relations efforts.

ITE is an international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs. ITE facilitates the application of technology and scientific principles to research, planning, functional design, implementation, operation, policy development and management for any mode of ground transportation. Through its products and services, ITE promotes professional development of its members, supports and encourages education, stimulates research, develops public awareness programs and serves as a conduit for the exchange of professional information.

Founded in 1930, ITE is a community of transportation professionals including, but not limited to transportation engineers, transportation planners, consultants, educators and researchers. Through meetings, seminars, publications and a network of nearly 17,000 members, working in more than 90 countries, ITE is your source for expertise, knowledge and ideas.

For a complete listing of all of ITE's 2010 award winners, visit the ITE Web site at http://www.ite.org/AnnualMeeting.

2010 MOVITE President Angelo Lombardo receiving the Section Activities Award from International ITE President Paul Eng-Wong

State Wide Striping Contract Available to Oklahoma Municipalities

By James Montgomery, ODOT

(Continued from page 9)

Table 2 shows when to use thermoplastic stripe and the thickness to be used based on volume:

THERMOPLASTIC STRIPE POLICY

Partial Controlled Access Facilities (2 lanes or more)

Asphalt Surfaces*	4" white lane lines 4" yellow and 4" white edge lines

2 Lane Highways

Asphalt Surfaces*	4" yellow center lines 4" white edge lines

*For ADT's of 5000 or greater, standard thickness (120 mils), hot-applied thermoplastic shall be used; for ADT's less than 5000 and greater than 2500, thin-line (70 mils) thermoplastic stripe shall be used; for ADT's less than 2500, waterborne paint shall be used.

Also, the contract has pay items for R/R symbols, arrows, words, STOP bars and other pavement marking needs. The contract also has special provisions for minimum retro-reflective for both thermoplastic and multi-polymer pavement markings. This assures the municipalities and the counties that the stripe will be reflect for nighttime driving.

The current contractor for the statewide striping contract is Action Safety Supply Company. You may contact Mr. Jerry Hietpas at 405.787.2244 to discuss what your needs are for your municipality or county. You may also look at the statewide striping contract at the Department of Central Services website at www.ok.gov/DCS. Click on Central Purchasing then Statewide contracts and then click on SW 776 to look at the prices for pavement markings or go the OTEA website to see the contract. For further information, contact James Montgomery, Oklahoma Department of Transportation, at 405.521.4302.

MUTCD Pavement Marking Standards

CHAPTER 3B. PAVEMENT AND CURB MARKINGS

Section 3B.01 Yellow Center Line Pavement Markings and Warrants

Standard:

01 **Center line pavement markings, when used, shall be the pavement markings used to delineate the separation of traffic lanes that have opposite directions of travel on a roadway and shall be yellow.**

09 **Center line markings shall be placed on all paved urban arterials and collectors that have a traveled way of 20 feet or more in width and an ADT of 6,000 vehicles per day or greater. Center line markings shall also be placed on all paved two-way streets or highways that have three or more lanes for moving motor vehicle traffic.**

Oklahoma Traffic Engineering Association

Please Reply to:
4405 Trophy Drive
Norman, OK 73072
Phone No. (405)360-6664

CLASS REGISTRATION FORM

Class Date: February 2 - 4, 2011

Location: Moore Norman Technology Center
4701 12th Avenue NW, Norman, OK 73069
(Room A-200)

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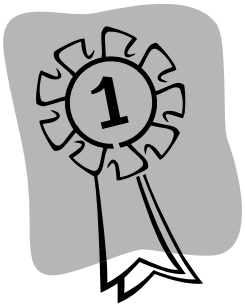
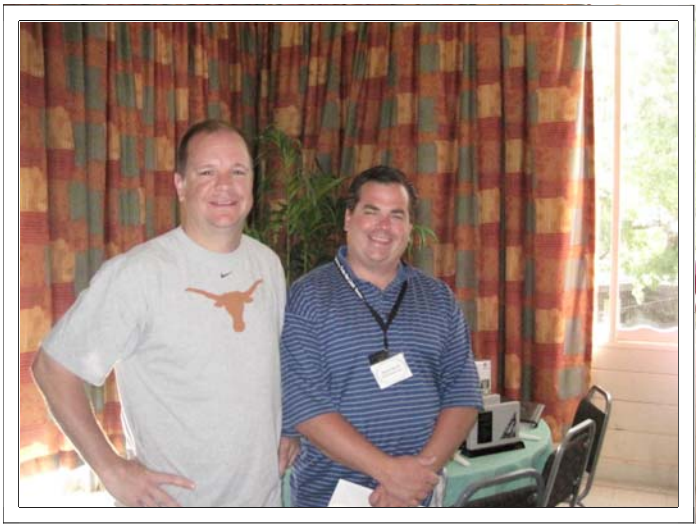
2010 OTEA GOLF TOURNAMENT WINNERS



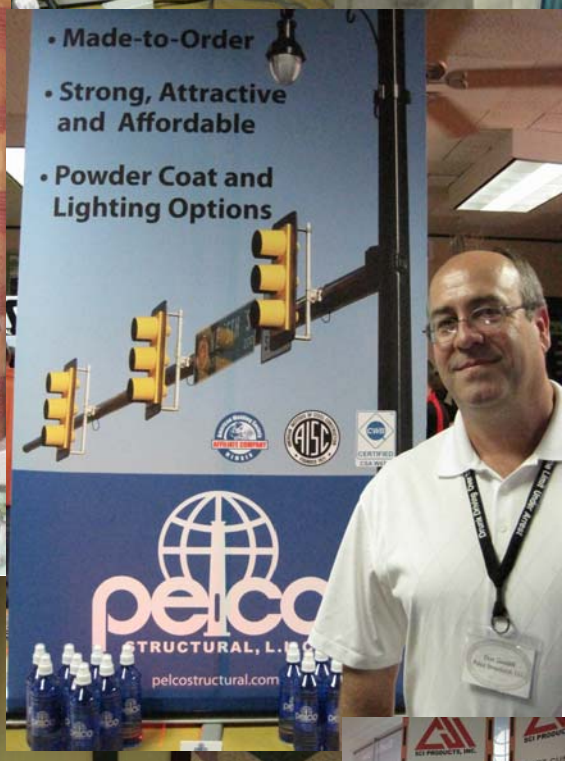
1st Place - 10 Under Par 60
Greg Heiptas, Jeremy Fileds, Tammy Robinson and Daniel Humphrey

2nd Place - 7 Under Par 63
Randy Barth, Brian Taylor, Ashley Hawkins and Randy Barth



3rd Place - 7 Under Par 63
Howard Rife, Steven Johnson, Brian Glover and Charlie Lee

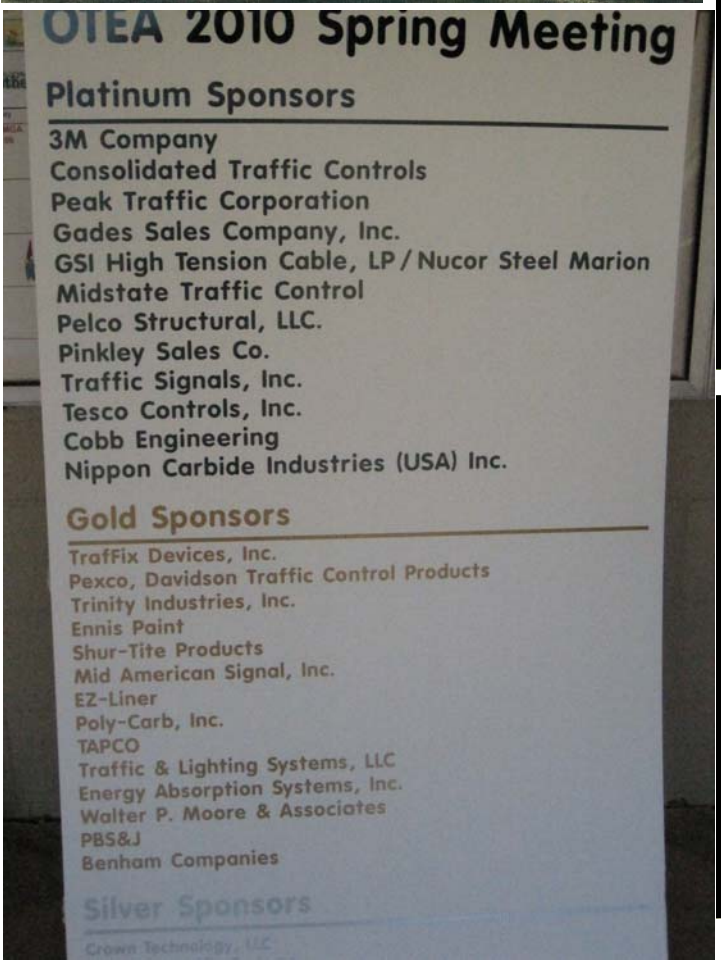
2010 OTEA MEETING IN PICTURES



2010 OTEA GOLF TOURNAMENT

2010 OTEA GOLF TOURNAMENT

Lake Murray Golf



2010 OTEA GOLF TOURNAMENT

Cable Barriers Lead to Dramatic Reduction of Crossover Fatalities in Oklahoma

By Faria Emamian, P.E.

In 2007, the Oklahoma Department of Transportation began an aggressive plan to increase the miles of cable barrier installed around the state in an effort to reduce the number of people killed in median cross over collisions. The results have been dramatic.

Prior to the installation, 41 people were killed across the state in median crossover collisions. Now hundreds of miles of cable barriers have been installed in the state. At the end of September 2010 the number of fatalities stood at six – even including collisions occurring in areas where cables have not yet been installed.

In 2001, Oklahoma installed the nation's first high-tension cable barrier system on Lake Hefner Parkway in Oklahoma City. That installation provided the spark to install a statewide system of cables. Now, almost a decade later, the high-tension cable barriers are in use by about 40 states.

The impetus came four years after ODOT completed the parkway, when a string of median crossover fatality collisions sent engineers looking for ways to improve safety by focusing on this type of accident, which often results in personal injuries or fatalities.

Although the cable barrier system, manufactured by Brifen, was in use in parts of Europe, it had never been tried on U.S. highways. ODOT engineers decided to install cable barriers, which at the time were one-third the cost of concrete barriers to determine whether the high-tension cables would be effective in reducing fatalities on American highways.

The barriers were so successful that when the Oklahoma Legislature passed a series of bills to increase the department's budget, ODOT leaders early on dedicated funds to install the safety devices across the state.

The plan was to install 240 miles of the barrier across Oklahoma. However, to date, about 420 miles of cable barrier has been or is being installed on state highways, and another 85 miles of barrier is planned during the next eight years.

Although the installation of cable barriers has been successful at reducing the number of median crossover collisions, no device is perfect. Motorists must still exercise normal caution when driving.

When engineers began planning to expand the system statewide, they decided to first address areas with the highest concentrations of crossover accidents.

Cable barriers cost about 90 percent less than concrete barriers and have other advantages as well:

- Repairs are less expensive than on other barrier systems.
- For drivers, and their passengers, the cables provide a "soft" impact in which much of the energy of a collision is absorbed by the cables rather than deflected back into the vehicle.
- Repairs can be made quickly following a vehicle impact – sometimes within 30 minutes.

One established requirement for ODOT is using Test Level 4 cable barrier systems.

The test levels, established by the National Cooperative Highway Research Program Report 350, are used when deeming the crash worthiness of several different types of highway hardware – cable barrier being one. Test Level 3 is designed and tested to stop a half ton pickup truck. Test Level 4 is designed stop a single unit vehicle such as a delivery truck or van.

High-tension cable barrier systems have three basic elements: three to four pre-stretched cables, anchors at each end of the cables to maintain tension and posts between to hold the cables in place.

Although some states use barriers with only three cables, ODOT specifies a fourth. By adding the fourth ca-

(Continued on page 21)

Annual Meeting Recap

By: Angelo A. Lombardo, P.E.

(Continued from page 5)

sors. The generosity of the thirty two companies who participated turned into a direct contribution of almost $12,000. Again, thanks for your generosity and dedication to the organization and our profession. As always, it is through their support that we are able to keep registration fees well under the average for this type of meeting, specially this year with the very low $50.00 registration fee charge for the 3-day meeting. Keep them in mind when you need equipment materials or services. They are listed on the right side of this page. Platinum sponsors are those that contributed $500 or more, Gold Sponsors between $300 and $499, and Silver Sponsors between $150 and $299.

The meeting was attended by a record 169 people. The technical program included seven different presentations on a wide range of topics.

After President Harold Smart's opening remarks, Mr. David Streb, ODOT's Assistant Director for Pre-Construction, delivered the key note address. His theme was multimodal transportation as he described design elements of a new Interstate bridge in the Tulsa area that is being designed to carry vehicular, pedestrian, bicycle and passenger train traffic.

The rest of the morning was covered with a two-part presentation by Greg Schertz, who works for the Federal Highway Administration. He clarified for many of us the new MUTCD requirements dealing minimum sign reflectivity requirements and the inventory and management program options. Greg described in detail the reason for the adoption of a minimum reflectivity standard and the different techniques available to public agencies for the development of comprehensive sign inventory and management systems. His presentation was followed by a panel discussion of government agency representatives (Federal, State, County and City) who shared how they are attempting to meet the new MUTCD sign reflectivity and inventory requirements.

The afternoon session began with a presentation by ODOT's James Montgomery on the major changes to Chapters 2 (Signs), 3 (Pavement Markings) and 4 (Traffic Signals) in the 2009 MUTCD.

Next on the agenda was ODOT's David Glabas who presented a number of innovative low cost safety improvements tried around the country. Tim Proch with 3M Company followed with a presentation on the new MUTCD requirements for safety apparel.

The last two presentations of the day were offered by Raymond Somich, with Poly Carb, Inc., and Kent Kacir, with Kimley Horn Associates. Raymond talked about the latest technology on pavement marking materials (multi-polymer traffic paint) and Kent described Edmond's development of its ITS plan.

Thursday activities were wrapped-up with the traditional banquet, the presentation of the three annual OTEA scholarships, a fun night of bingo and lots of music and singing in the hospitality suite.

The Business meeting was held on Friday morning with reports given on the organization's finances, work zone safety training and MOVITE section activities. The results of the election were announced and the new board introduced.

For 2010-2011, the organization will be led by President-Elect Stuart Chai, OKC Chief Traffic Engineer, Vice President Don Russell, President of Russell Engineering Company, Past President Harold Smart, and Directors James Montgomery, Charlie Lee and Michael Hofener.

Finally, Marty Pinkley presented the results of the golf tournament and thank the many sponsors who made

(Continued on page 23)

Cable Barriers Lead to Dramatic Reduction of Crossover Fatalities in Oklahoma

By Faria Emamian, P.E.

(Continued from page 19)

ble, a wider range of vehicle heights can be deflected and a closer vertical spacing of the cables reduces the likelihood that a vehicle would not be stopped.

According to national studies, the average annual cost of the additional cable is just over $400 per mile, assuming a 25-year service life.

The spacing of posts and anchors also impacts the effectiveness of cable barriers.

For interwoven systems, such as Oklahoma's, maximum deflection is reached if anchors are spaced at 900 feet apart.

Many different post spacing positions were tested by the manufacturers who recommend post spacing within a range of 6.5 feet to 15 feet. ODOT chose to install posts about 10.5 feet apart because the main function of the post is to keep the cable at the correct elevation. There is little energy absorption from the bending of the post during a collision. Tests show the wider the spacing the more deflection of the cable. Therefore, wider spacing could increase the likelihood for cars to over-ride, under-ride, or go through the cables.

Since the posts need to be easily replaceable, footings are designed with sockets in order to accept new posts, stay in the ground and remain undamaged following hits.

The effectiveness of cable barrier systems also can be affected by their placement within the median.
Based on modeling tests by the Federal Highway Administration's, the most effective area was determined to be on top of the slope rather than in the middle of the median. However, with most cable performing best within wider medians, this was not always an option for all areas.

Optimal placement of the barrier also is affected by the slope of median ditches and whether the bottom is flat or v-shaped.

Other factors considered were: that water mainly drains off the roadway and into the median which can result in foundation deterioration and exposure; allow for mow-

(Continued on page 23)

The Transformation of Downtown OKC

By Michael Hofener, P.E.

Introduction

These are good times for the City of Oklahoma City. Beginning over 15 years ago the citizens of Oklahoma City took some pride in their city and passed a Metropolitan Area Projects (MAPS) sales tax. The first MAPS sales tax was passed by the citizens in December 1993. This visionary and aggressive capital improvement program was created to upgrade and create new sports, recreation, entertainment, cultural and convention facilities. The first MAPS project was such a success that two subsequent MAPS sales taxes have been passed to continue the improvements. Many of the projects and improvements that occurred as a result of these aggressive capital improvement programs have focused on the downtown Oklahoma City area. As a result, in the last 10 years there has been significant growth in the number of downtown businesses and residences. With this growth and revitalization of the downtown area, the attractiveness of downtown Oklahoma City for businesses increases on a yearly basis. In fact, one of the largest companies to ever locate in the downtown area has recently started construction on a 50 story tower. This tower will serve as the Devon Energy headquarters. The construction of this tower has begun an entirely new period of revitalization and enhancement of downtown Oklahoma City.

The construction of the Devon Energy Tower started a Tax Increment Financing (TIF) program for improvements to the downtown area. Additionally, the City of Oklahoma City had some general obligation bonds which have also been put towards improvements to the downtown area. In all, the total funds available for the City of Oklahoma City to utilize in renovating the downtown area sum to $140 million. The availability of these funds started a project that has since been labeled as Project 180. The project area to be renovated includes a land area of 180 acres. The name Project 180 was coined because the project is to renovate all 180 acres of downtown and turn it around 180 degrees from a less pedestrian friendly environment to a walkable community that creates a balance between all modes of transportation.. Due to the availability of the funds, this work is to be completely constructed in four years.

In addition to Project 180, there are three additional major projects occurring in the downtown area. Interstate 40, which runs directly to the south of downtown is being relocated a mile south. With the relocation of Interstate 40, ramp locations will change and as a result traffic patterns in the downtown area will also change. The relocation is expected to be completed in 2012. The second major project that is anticipated is the construction of a six-lane, divided boulevard through the downtown area. This is anticipated to be constructed in place of the existing Interstate 40 alignment and will serve as a major downtown corridor. The third project is a modern streetcar system to be installed as a result of a third MAPS project that was passed subsequent to Project 180 beginning. Routes of the modern streetcar are unknown as of today and are expected to be developed in the coming months. These three projects will add to the complexity of completing Project 180.

The City of Oklahoma City was then faced with an enormous challenge: How will such a massive downtown renovation project get designed and built in four years? As with any other engineering project, small or large, the best approach is to break the project into smaller parts or processes. There are three major processes that have been, and are currently, occurring on this project: 1.) Conceptualization Process, 2.) Design Process, 3.) Construction process. This paper discusses the various processes that have been undertaken in this project and the unique approach to meeting such an enormous challenge. A brief description of a few of the challenges and lessons learned to date is also provided.

The Process

The first process in the development of the project is conceptualization. Conceptualization is forming a general direction for the project, and ultimately determining what downtown Oklahoma City will look like as a result of Project 180. Decisions have to be made on a large number of elements and there are a large number of players that need to be a part of making those necessary decisions. There is so much information involved during this part of the process that the project could very easily be derailed (or paralyzed) as a result of an overload of information provided to decision makers. This can only be avoided by proper direction and facilitation of the necessary decision making processes. As a result the City of Oklahoma City deemed it appropriate to hire a landscape architecture firm that has managed similar projects. The knowledge and guidance this firm could provide will prove to be invaluable and will be key to the success of Project 180.

Project 180 officially began in June 2009 when the City of Oklahoma City hired a landscape architecture firm to assist in facilitating the many decisions that needed to be made for a project of this magnitude. Decisions such as what type of trees should be planted, what type of benches should be placed in the amenity zone, what color the amenities should be, what type of special signal equipment should be utilized and what color, etc. etc. To assist in the decision making process, two steering committees were developed and met on a monthly basis. One steering committee oversaw decision making for the on-street portions of the project and the other oversaw decisions for the Myriad Botanical Garden (a downtown park area) renovation portion of the project. In the initial stages of the project, the steering committees had to address decisions that had to be made with some general goals of Project 180 that the City of Oklahoma City had developed. Some of the goals of Project 180 are: 1.) to create a more walkable and pedestrian friendly downtown area, 2.) to improve the appearances of the downtown area, and 3.) to ultimately help create an environment that would be conducive to a world class central business district.

When creating a walkable community, one of the largest obstacles is the interaction of pedestrians and vehicles. In most successful walkable communities, a balance has been found between multiple modes of transportation: pedestrian, bicycle, transit, and vehicular. Since one of the major goals of this project is to create a more pedestrian friendly, walkable community, the first obstacle was to analyze the traffic flow in the downtown area and determine the best approach to creating an environment that would encourage people to walk. As a result, the City of Oklahoma City decided it would be beneficial to conduct comprehensive traffic study for the entire downtown area. The traffic study began in January 2009 and included a.m and p.m

(Continued on page 29)

Cable Barriers Lead to Dramatic Reduction of Crossover Fatalities in Oklahoma

By Faria Emamian, P.E.

(Continued from page 21)

ing safety within the median and avoiding interference with traffic; and keeping cable far enough from edge line to account for vehicle deflection in accidents.

Credited with preventing hundreds of head-on collisions, cable barrier systems have been shown to significantly reduce fatalities in areas where they have been installed.

A look at accident statistics for the nation's first cable barriers on Lake Hefner Parkway indicates why the reduction is so significant. In the nine years prior to cable barrier installation, eight people died on this seven-mile stretch of highway in Oklahoma City as a result of median crossover collisions. In the nine years since cable barriers were installed, the number of fatalities stands at one – from a collision in which a semi crossed the barrier.

The number of injuries resulting from median crossover collisions also shows an impressive reduction on Lake Hefner Parkway. In the nine years prior to installation 65 people were injured in median crossover collisions. In the nine years since installation, the number is six.

Annual Meeting Recap

By: Angelo A. Lombardo, P.E.

(Continued from page 20)

the event a great success.

Angelo Lombardo recognized the many meeting sponsors whose contributions allowed the meeting to remain affordable for most of us. The business meeting was adjourned around 10:30 a.m.

Special thanks to Harold Smart and the rest of the Board for leading OTEA during this past year. Also a special thank you to Phyllis McElroy for her hard work behind the scenes, including her handling the meeting registration table.

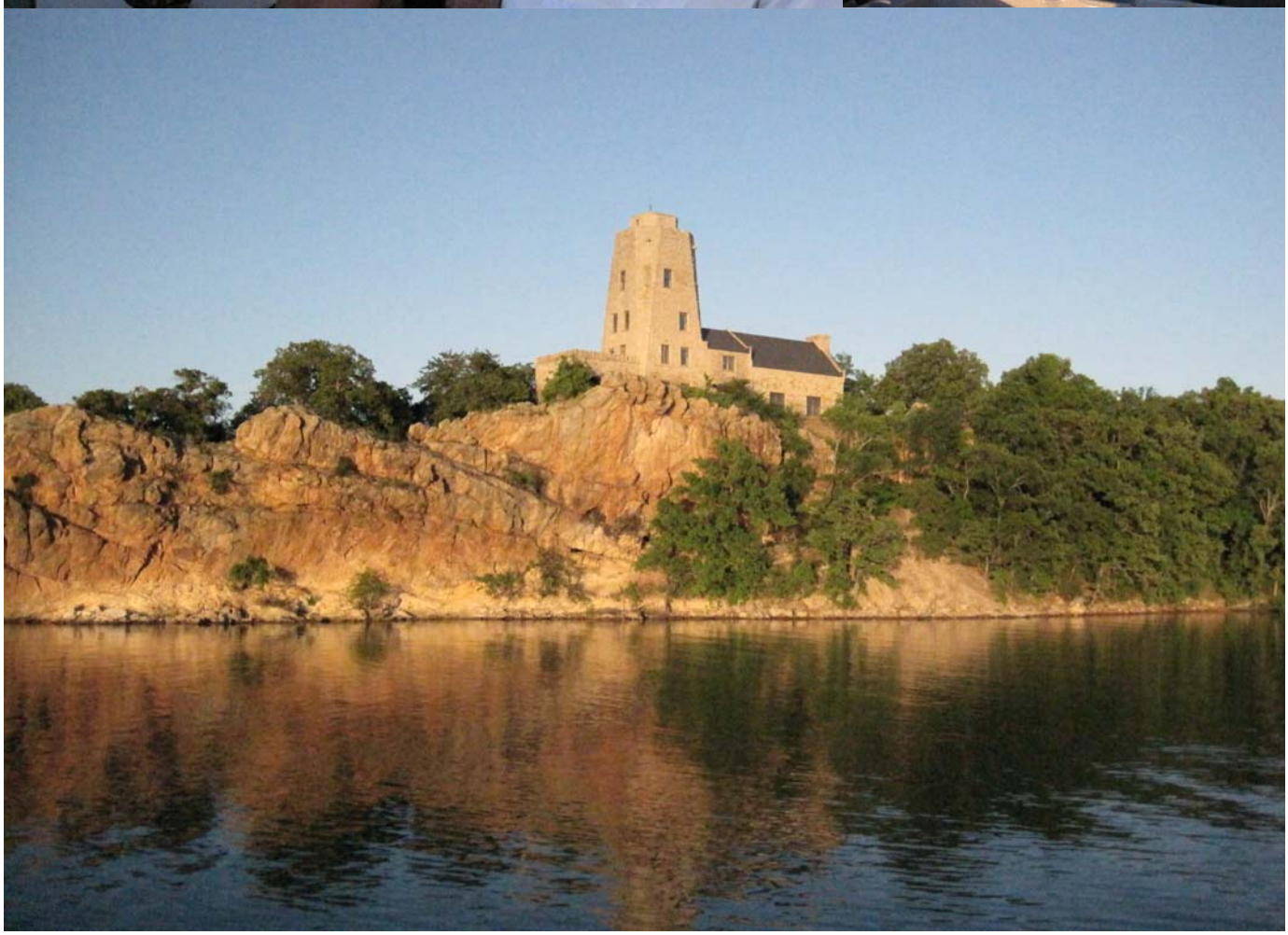
Thanks to all who attended and for making our annual gathering a very successful, entertaining and informative meeting! Best wishes during this holiday season - Feliz Navidad!

Yours truly,

Angelo

2010 OTEA MEETING IN PICTURES

2010 OTEA MEETING IN PICTURES



2010 OTEA MEETING IN PICTURES

As Boomers Age 1 in 5 Drivers will be Oldsters

Associated Press

WASHINGTON (AP) — Remember "The Little Old Lady from Pasadena"? Baby boomers who first danced to that 1964 pop hit about a granny burning up the road in her hot rod will begin turning 65 in January. Experts say keeping those drivers safe and mobile is a challenge with profound implications.

The National Transportation Safety Board is holding two-day forum beginning Tuesday to better understand the safety risks that older drivers face.

Within 15 years more than one in five licensed drivers will be 65 or older, the safety board said. Their number will nearly double, from 30 million today to about 57 million in 2030, according to the Government Accountability Office.

Smarter cars and better designed roads may help keep them stay behind the wheel longer.

But eventually most people will outlive their driving ability — men by an average of six years and women by an average of 10 years. And since fewer Americans relocate when they retire, many of them probably will continue to live in suburban homes.

The result is a "mobility gap," said Joseph Coughlin, head of the Massachusetts Institute of Technology's AgeLab, which develops technologies aimed at keeping older people active.

"For many, our homes will not be just a place to age, it will also be house arrest," said Coughlin.

Older drivers who are healthy aren't necessarily any less safe than younger drivers. But many older drivers are likely to have age-related medical conditions that can affect their driving.

A 40-year-old needs 20 times more light to see at night to see than a 20-year-old, Coughlin said. Older drivers generally are less able to judge speed and distances, their reflexes are slower, they may be more easily confused and they're less flexible, which affects their ability to turn so that they can look to the side or behind them.

Fatal crash rates for older drivers compared with other age groups begin to increase starting at about age 75, according to the Insurance Institute for Highway Safety. Drivers over age 85 have a worse fatality rate than teenagers and drivers in their early 20s.

The main reason is that older drivers are more frail and less likely to survive an accident or recover from injuries, according to the institute. Older drivers primarily kill themselves in crashes, with these accounting for 61 percent of deaths in accidents involving drivers 70 and older. Sixteen percent of the deaths were their passengers.

Many older drivers compensate for the erosion of their driving abilities by changing their driving habits.

"I'm never in a rush," said Grace M. Sanders, 87, a retired secretary in Atlanta. She takes care to map out a route in her mind before she leaves the house. She avoids driving near construction sites. If it's raining, she stays home.

But even though she could take the bus, it's important to Sanders that she keep her car.
"I always wanted to be an independent person and I maintained that independence throughout my life," she said.

New technologies, some of them borrowed from the military and commercial aviation, may help older drivers stay behind the wheel longer, and more safely. Crash warning systems using sensors embedded in the car can alert drivers to an impending accident. They can even override the driver and apply the brake. Similar technology can parallel park the car. Night vision systems can help with one of the most frustrating problems for older drivers.

Not every remedy involves new technology. Sometimes it's just a matter of making dials larger so they're easier for drivers

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2010 OTEA MEETING IN PICTURES

The Transformation of Downtown OKC

Michael Hofener, P.E.

(Continued from page 22)

peak hour analysis of 41 intersections. Traffic generated by proposed developments, including the Devon Tower was also included. Existing conditions were analyzed and future 2030 conditions were analyzed. Additionally, multiple geometric alternatives were analyzed which included the analysis of the conversion of existing one-way pair streets through the downtown area to two-way streets.

Based on the results of the comprehensive traffic study the City of Oklahoma City determined it would be beneficial to convert all one-way pair streets in the downtown area to two-way streets. The traffic study indicated that traffic patterns would result in acceptable levels of service under the two-way alternative. It was anticipated that this would provide many benefits to the motoring public, transit systems, as well as to pedestrians. The conversion of one-way to two-way streets will allow for less confusion to motorists that do not drive in the downtown area on a regular basis and it will also provide multiple route options throughout downtown. The transit system will benefit from the opportunities provided as a result of the addition route options. The pedestrians will benefit from narrower streets, less traffic to have to interact with (due to the dispersion of traffic as a result of multiple route options), and the potential for access to more transit stops.

The landscape architecture hired by the City to help guide Project 180 took the results from the traffic study and began laying out potential cross sections for each street segment. Through many meetings with the City and with the steering committees, an overall plan was created for the entire Project 180 area. For every street in the project area, the plan extended from building face to building face. On each street every sidewalk, amenity zone, tree/shrubbery zone, parking lane, bicycle lane, vehicular lane, and median was determined. From this plan, the landscape architect then began to create the design documents for Project 180. At the onset of the project in June 2009, a firm was hired to conduct a comprehensive survey throughout the project area. Surveying was conducted from June 2009 to December 2009. The landscape architect utilized the survey and laid out the geometry of each intersection (as determined from the comprehensive traffic study) as well as each street segment cross section. The development of this document marked the beginning of the design process.

In order to meet the aggressive schedule of this project, the City determined the best way to get a large amount of design completed in the shortest amount of time possible would be to break the entire project area into 8 design sections and hiring 8 separate firms to design one section a piece. In April of 2010 eight separate civil engineering firms were hired to begin the development of the construction documents for Project 180. In addition to the eight civil engineering firms hired to conduct the roadway design, an additional landscape architecture firm was hired to create construction documents for all landscape related items throughout the project area, an additional traffic engineering firm was hired to create construction documents for all signal design, signing, and striping throughout the project area, and an additional civil engineering firm was hired to coordinate and manage the location of all existing and proposed utilities throughout the project area. With the addition of the City and the original landscape architecture firm, this became the Project 180 team.

Once the design process was established and underway, the next challenge was to determine the best approach to getting the project constructed. Through hours of discussion and brainstorming amongst the Project 180 team, it was determined the most efficient way to construct the project would be by phase, similar to the same approach taken in the design process. Unfortunately, due to temporal budget constraints the project could not be broken into construction phases that mirrored the design sections. The Project 180 team then had to determine how to define the construction phases for Project 180. One of the first tasks of the Project 180 team during the design phase was to layout an overall map that showed a master sheet index. The sheet index document is a plan view of the project area that shows every plan sheet to be included in the construction document. Each sheet was then given a unique identifying number based on what section engineer was responsible for it. Utilizing the master sheet index, the section engineers then determined a rough cost estimate on a per sheet basis. Since the City knew when certain funds would become available, an ultimate cost per construction phase was already set. Utilizing the estimated costs per sheet, construction phases were defined by summing the total estimated costs (by sheets) to not exceed the preset cost for a particular phase of construction.

The Project 180 team then determined the limits of the first four construction phases. Construction on these four construction phases is to begin by November 2010. Phase 1 was let for construction in July 2010 and the three subsequent phases are scheduled to be let in August, September, and October for phases 2, 3 and 4, respectively. It is anticipated that four phases will be let for construction each year through the year 2014. In total, this will result in the Project 180 area being divided into 16 construction phases.

Logistical Challenges/Lessons Learned (To Date)

This project has been very challenging. To date, the development of construction documents has only begun on 4 of the estimated 16 phases. Many challenges have been overcome, but there will be many more to come. The following section gives a brief description of a few of the challenges that have been encountered, and the approach the Project 180 team has taken to meet them. This project is very much a work in progress and the lessons that are being learned now will serve the Project 180 team better in the future as they are reapplied to future phases of the project. It will be prudent and is a goal of the author to follow this report with an updated report once multiple phases of the project have been constructed.

One of the first challenges results from the way the construction phases were determined. When the construction phases were determined, the design sections were not taken into account, priority was given to the location of the proposed construction phases. This resulted in construction phases that span areas that involve multiple section design engineering firms. In some cases, there are construction phases that include four design section engineering firms. With the addition of a traffic engineering firm, a utility coordination firm, and a landscape architect firm this phase has seven firms that have to work in conjunction with one another for the development of con-

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The Transformation of Downtown OKC

Michael Hofener, P.E.

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struction documents. This is a logistical challenge for the Project 180 team and requires a high level of organization.

One organizational tactic undertaken in this process was the development of a website for the Project 180 team. The website is utilized for the transfer of files and the sharing of information among the various players on the Project 180 team. Each engineering firm involved in Project 180 has its own folder within the website and is required to keep all plan files up to date. This provides any firm on the Project 180 team the ability to reference and utilize necessary files to create the necessary design documents for each phase. The updated utility files and survey files are also maintained on this website.

Another challenge is maintaining consistency among plan sets. This includes everything from plan sheet borders to line weights and plan set symbology. Early in the project, a sheet border was created and posted on the Project 180 website. All firms are required to utilize this sheet border. The Project 180 team also determined the best approach to maintaining consistency among plans was to utilize the US National CAD Standard. This set all line styles and weights as well as symbology for the plan sets. A sample plan sheet was then created and placed on the Project 180 website and was to be utilized by all civil engineering firms as the go-by template.

Another strategy that has proven very worthwhile through this process is a mandatory bimonthly meeting held for the Project 180 team. This meeting serves as a very good forum for open discussion on various challenges encountered during design and facilitates the discussion and decision making that is required to address those challenges. The meetings generally last 2 hours and meeting minutes are recorded for each meeting and posted on the Project 180 website. This provides a very good process for making decisions with all necessary players involved and creates good records for how and when decisions were made for various items throughout the project.

As of the date of this report being written (August 2010), the construction phase one project recently started construction, the construction phase 2 project is scheduled to be bid, the construction phase 3 is under review at the City of Oklahoma City, and development of construction documents for construction phase 4 is well underway.

Due to the aggressive schedule, the construction documents had to be developed in a very short amount of time. As result, some assumptions had to be made for various items in order to keep the development of the construction plans from being delayed. Decisions for many of the outstanding issues were made after the projects had gone out to bid and addendums had to be made. To date phase 1 has undergone 2 addendums and phase 2 has undergone 3 addendums (with 1 addendum pending). The various addendums have added an additional level of complexity to maintaining consistency among plans. Very stringent record keeping is crucial, a change that is made for one phase commonly affects other phases as well, and needs to be reflected on all subsequent phases. Working on multiple phases at one time only exacerbates the challenge. Documents are being maintained internally to each civil engineering firm that has record of every addendum made to each phase. This document is updated every time any addendum item is modified and is reference for each subsequent phase. While this is not a perfect system, this does help to maintain consistency among construction phases.

These are just a few of the challenges that the Project 180 engineers are encountering during this process. Some of the challenges were foreseen early in the project and many were not initially anticipated. The overall process has been very challenging and while there has been a significant amount of planning for the execution of the project, there are still many challenges that arise every day and are still to be overcome. This is a learning process and is challenging even the best in the business.

As stated by Laura Story, with the Oklahoma City Public Works Department, “Project 180 is the most ambitious downtown transformation in the country.” The combination of the size of this project and the aggressive schedule has resulted in a unique design and construction process that is deliberate yet has had and will have many lessons learned.

The Tao of Traffic: Go with the Flow

If stoplights bend to cars, a study says, the way grows clearer

By: Rachel Ehrenberg

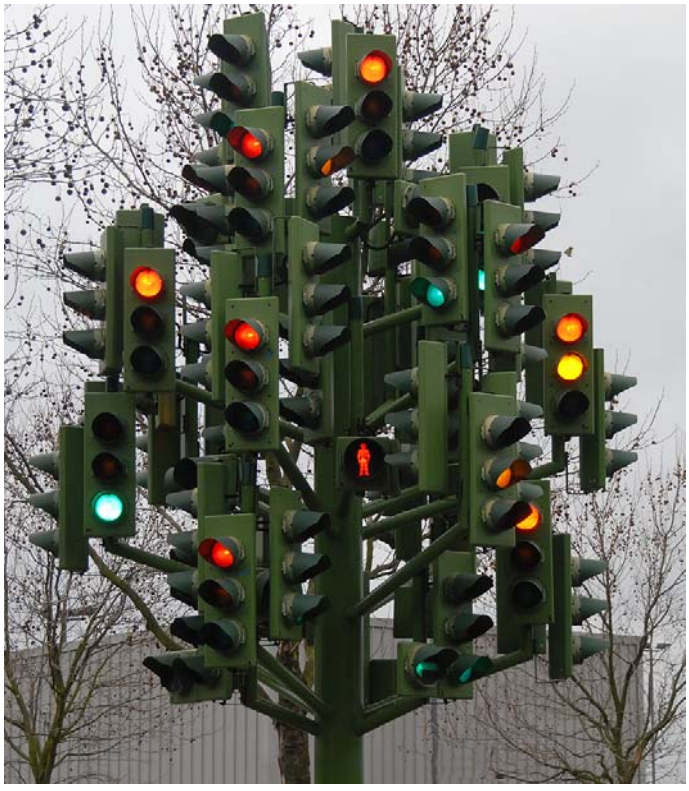
Traffic lights that act locally can improve traffic globally, new research suggests. By minimizing congestion, the approach could save money, reduce emissions and perhaps even quash the road rage of frustrated drivers.

The new approach makes traffic lights go with the flow, rather than enslaving drivers to the tyranny of timed signals. By measuring vehicle inflow and outflow through each intersection as it occurs and coordinating lights with only their nearest neighbors, a systemwide smoothness emerges, scientists report in a September Santa Fe Institute working paper.

"It's very interesting — the approach is adaptive and the system can react," says mechanical engineer Gábor Orosz of the University of Michigan in Ann Arbor. "That's how it should be — that's how we can get the most out of our current system."

An ultimate goal in traffic regulation is "the green wave," the bam, bam, bam of greens that allows platoons of vehicles to move smoothly through intersection after intersection. When that happens, no drivers have to wait very long and sections of road don't become so filled with cars that there's no room for entering vehicles when the light does go green.

To achieve this rare bliss, traffic lights usually are controlled from the top down, operating on an "optimal" cycle that maximizes the flow of traffic expected for particular times of day, such as rush hour. But even for a typical time on a typical day, there's so much variability in the number of cars at each light and the direction each car takes leaving an intersection that roads can fill up. Combine this condition with overzealous drivers, and intersections easily become gridlocked. Equally frustrating is the opposite extreme, where a driver sits at a red light for minutes even though there's no car in sight to take advantage of the intersecting green.



"It is actually not optimal control, because that average situation never occurs," says complex-systems scientist Dirk Helbing of the Swiss Federal Institute of Technology Zurich, a coauthor of the new study.

"Because of the large variability in the number of cars behind each red light, it means that although we have an optimal scheme, it's optimal for a situation that does not occur."

Helbing and his colleague Stefan Lämmer from the Dresden University of Technology in Germany decided to scrap the top-down approach and start at the bottom. They noted that when crowds of people are trying to move through a narrow space, such as through a door connecting two hallways, there's a natural oscillation: A mass of people from one side will move through the door while the other people wait, then suddenly the flow switches direction.

"It looks like maybe there's a traffic light, but there's not. It's actually the buildup of pressure on the side where people have to wait that eventually turns the flow direction," says Helbing. "We thought we could maybe apply the same principle to intersections, that is, the traffic flow controls the traffic light rather than the other way around."

Their arrangement puts two sensors at each intersection: One measures incoming flow and one measures outgoing flow. Lights are coordinated with every neighboring light, such that one light alerts the next, "Hey, heavy load coming through."

That short-term anticipation gives lights at the next intersection enough time to prepare for the incoming platoon of vehicles, says Helbing. The whole point is to avoid stopping an incoming platoon. "It works surprisingly well," he says. Gaps between platoons are opportunities to serve flows in other directions, and this local coordination naturally spreads throughout the system.

"It's a paradoxical effect that occurs in complex sys-

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The Tao of Traffic: Go with the Flow

If stoplights bend to cars, a study says, the way grows clearer

By: Rachel Ehrenberg

(Continued from page 31)

tems," says Helbing. "Surprisingly, delay processes can improve the system altogether. It is a slower-is-faster effect. You can increase the throughput — speed up the whole system — if you delay single processes within the system at the right time, for the right amount of time."

The researchers ran a simulation of their approach in the city center of Dresden. The area has 13 traffic light –controlled intersections, 68 pedestrian crossings, a train station that serves more than 13,000 passengers on an average day and seven bus and tram lines that cross the network every 10 minutes in opposite directions. The flexible self-control approach reduced time stuck waiting in traffic by 56 percent for trams and buses, 9 percent for cars and trucks, and 36 percent for pedestrians crossing intersections. Dresden is now close to implementing the new system, says Helbing, and Zurich is also considering the approach.

Traffic jams aren't just infuriating, they cost time and money, says Orosz. Estimates suggest that in one year, the U.S. driving population spends a cumulative 500,000 years in traffic at a cost of about $100 billion. And the roads are just going to get more congested. The optimal way of dealing with such congestion is to take an approach like Helbing's and combine it with technologies that deal with driver behavior, Orosz says. Car sensors that detect the distance between your bumper and the car in front of you can prevent a sweep of brake-slamming that can tie up traffic, for example.

"In general these algorithms improve traffic, but maybe not as much as they do on paper because we are still human," he says. "It is still humans driving the cars."

Source: Science News, October 23 ,2010

As Boomers Age 1 in 5 Drivers will be Oldsters

Associated Press

(Continued from page 27)

to find. A strap can be added to hold onto when getting in and out of a car. An extended mirror can help drivers avoid turning around as much.

"They may extend the driving careers of some seniors, but they are certainly not a panacea," cautioned Dr. Bonnie Dobbs, a gerontology professor at the University of Alberta. She notes that many technologies could distract or confuse older drivers, which could lead to accidents.

Better designed roads may also help. For example, traffic "roundabouts" that gently ease drivers into turn circles with no traffic lights could help reduce left turn-related crashes, which make up a disproportionate share of the accidents that kill older drivers.

What's not being addressed is how to keep older Americans mobile after they lose their driving skills, said University of Arizona professor Sandra Rosenbloom, an authority on the transportation implications of trends such as an aging population.

"As people get older and lose the ability to drive, they narrow and narrow their circle of friends and their circle of activities until it gets to the point where they are housebound and they don't move at all," Rosenbloom said.

Public transportation — buses and trains — isn't a realistic option for most people who have lost the ability to drive, Rosenbloom said. By the time that happens, the physical and mental conditions that made driving untenable are also likely preclude hiking to a bus stop, especially if there's no bench. The act of getting on and off a bus can be prohibitive. Many older people — especially those over 80 — also worry about losing their balance on a bus and fear being victimized.

Marcia Savarese, 73, began driving when she was 16. In 2008, she suffered a stroke and didn't drive for a year. Instead, she depended on friends, expensive taxis and delivery services.

Now, she's back on the road despite a loss of some of her peripheral vision. To compensate, she said she's trained herself to turn around to look more than before. She rarely drives at night, and she stays off the interstate. She does much of her grocery shopping and other errands early in the morning when parking lots are nearly empty. Rarely does she drive more than a few miles from home.

"I feel it is safer for other people if I stay right in the local area that I know," said Savarese, a widow and retired estate jewelry dealer in Vienna, Va. She didn't want to move from her neighborhood, where she has lived for the past 40 years.

"I'm more comfortable here," she said. "My friends are here, my doctors are here, everything is here."

Source: Associated Press – November 9, 2010

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- Contributions from any person are welcomed.
- The information presented in this newsletter does not necessarily reflect the views of O.T.E.A.
- Any product mentioned is not endorsed by O.T.E.A.
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- Send articles, comments or suggestions to Angelo Lombardo, Editor, 4405 Trophy Drive, Norman OK 73072 or E-Mail at OTEField@sbcglobal.net.

2010 OTEA SPRING MEETING FINANCES

INCOME	
Meeting Sponsorship	$ 11,899.00
Registration *	$ 5,031.00
Golf Sponsorship	$ 1,600.00
Total Income	**$ 18,530.00**
EXPENSES	
Printing and Mail	$ 344.18
Registration Supplies	$ 95.00
Door Prizes	$ 1,998.69
Dinner Cruise	$ 880.00
Lake Murray Lodge	$ 6,376.17
Registration Gift	$ 2,580.04
Annual Dues	$ 4,225.00
Total Expenses	**$ 16,499.08**
NET PROFIT	**$ 2,030.92**
* Includes $4,225 in membership dues	

MEMBER NEWS

BILL LESHER RETIRES

Bill Lesher retires after a long career as a traffic signal technician working for Traffic & Lighting Systems, Inc.

Congratulations and best wishes to Bill on his re-

JERRY EMERSON RETIRES - AGAIN

Jerry Emerson announced his retirement from Brifen USA.

Jerry retired from FHWA and joined Brifen USA to promote the use of median barrier cables.

Congratulations and best wishes to Jerry on his

KEN MORRIS RETIRES

Ken Morris announced his retirement for the Benham Companies.

Before joining Benham Ken worked as the Chief Traffic Engineer for the City of Oklahoma City.

His immediate plans are to travel with his wife.

OTEA WELCOMES THE FOLLOWING NEW MEMBERS

Timmy Don Adams - City of McAlester
Souzan Bahavar - FHWA
Royce Bartee - Marshall County
Roy Wayne Blevins - Johnston County
Marc Bower - Shur-Tite Products
Marc Breidy - Student
Sherry Brown - OHSO
Denny Butler - Association of County Commissioners
Pete Byars - ODOT - Retired
Keith Byrd - Tulsa County
J.D. Christiansen - Student
John Clink - City of Norman
Gillette Cobb - Jacobs Engineering
Jeremy Colibert - Cobb Engineering
Robyn Cross - Poe & Associates, Inc.
Larry Dearing - City of Broken Arrow
Jose Delgado - Traffic & Lighting Systems
Niranjan Desai - MKEC Engineering Consultants
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Dale Frech - Association of County Commissioners
Shannon Hanks - Garver, LLC
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Josh Hughes - Cleveland County
Daniel Humphrey - PBS&J
Jim Hunt - PBS&J
Trenton January - Student
Gary Jester - Cleveland County
Steven Johnson - Cobb Engineering Company
Andrea Jones - Leotek Electronics, Inc.
Richard Jones - Jones Power Products
Kent Kacir - Kimly Horn
Pam Kellett - Crown Technologies, LLC
Danny Lowe - Johnston County
Kim Ludwig - Energy Absorption Systems, Inc
John Mathews - City of Ada
Terry McSwain - Johnston County
James Milroy - ODOT
Paul Patterson - Cherokee County
Bryan Richards - Cobb Engineering Company
David Riesland - City of Norman
Rick Riggs - Cleveland County
Kevin Robinson - Carter County
Jim Ruggeri - Pexco/Davidson Traffic Control Products
Jeff Schlittenhardt - Direct Traffic Control, Inc.

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