# 1st Summer Conference on Livable Communities

**July 15, 2014**

**College of Engineering and Applied Sciences**
**Western Michigan University, Kalamazoo, Michigan**

**US DOT Tier 1 University Transportation Center**

Transportation Research Center
*for Livable Communities*

**Western Michigan University | University of Texas at Arlington | Utah State University**
**Wayne State University | Tennessee State University**

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# Overall Schedule

1. Registration (10:00 – 10:30)

2. Opening (10:30 – 10:40)
   Jun-Seok Oh, Director of Transportation Research Center
   Paula Kohler, Associate Vice President for Research, Western Michigan University

3. Session 1 (10:40 - 12:00) – People with Disability and Transportation Services
   Moderator: Dr. Richard Long, Blindness and Low Vision Studies, Western Michigan University

4. Lunch (12:00 - 1:00)

5. Session 2 (1:00 – 2:20) – Health and Environmental Issues in Transportation
   Moderator: Scott Smith, Geography, Western Michigan University

6. Break (2:20 – 2:30)

7. Session 3 (2:30 – 3:50) – Non-motorized Transportation and Safety
   Moderator: Valerian Kwigizile, Civil and Construction Engineering, Western Michigan University

8. Closing (3:50 – 4:00)

# Detailed Program

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| | [1-2] Better long cane design and biomechanics for blind cane users | Dae Kim, WMU |
| | [1-3] Leveraging the General Transit Feed Specification (GTFS) for Research, Workforce Development and Technology Transfer | Scott Smith, WMU |
| | [1-4] The Use of a Gateway R1-6 Sign Configuration to Increase Yielding to Pedestrians | Ron Van Houten, WMU |
| Lunch<br>12:00 – 1:00 | | |
| Afternoon 1<br>1:00 – 2:20 | [2-1] Raising Awareness of Patterns in Health Outcomes: Disparities in Poor Birth Outcomes in Southwest Michigan | Kathleen Baker, WMU |
| | [2-2] Exploring Opportunities for Engaging Public Health in Transportation Planning | Colleen Casey, UTA |
| | [2-3] Emission Performance Measures/ Indicators | Stephen Mattingly, UTA |
| | [2-4] Using Behavioral Attributes to Assess Pedestrian and Bicyclist Safety | Timothy Gates, WSU |
| | [2-5] Survey on Benefits of MDOT's Intelligent Transportation Systems | Matthew Clark, WMU |
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| | [3-2] Simulation Model for Analyzing Bicycle Friendly Kalamazoo Downtown | Marino Calderón Diaz, WMU |
| | [3-3] Alternatives for Providing a Safe Passage for Non-Motorized Traffic Across an Existing Highway Bridge – Research Needs and Methodology | Lizmert Lopez Gonzalez, WMU |
| | [3-4] A Study on Bicycle Safety | Hamidreza Ahady Dolatsara, WMU |
| | [3-5] Road Users' Hazardous Actions: Evidence from Michigan Crash Data | Elisha Wankogere, WMU |
| Closing<br>3:50 – 4:00 | Closing | |

# Presentation Abstracts

## [1-1] Conditions that Influence Drivers' Yielding Behavior at Uncontrolled Crossings and Intersections with Traffic Signal Controls

Robert Emerson, Professor
Blindness and Low Vision Studies, Western Michigan University

There is a dearth of studies on how pedestrian who are blind might positively influence driver yielding in different travel situations. This project will assess common pedestrian behaviors (head turning, holding a cane, taking a step, holding up a hand, exaggerated cane movement, standing without a cane) on yielding rate for right turning traffic at lighted intersections as well as at entry and exit lanes at roundabouts. Each pedestrian behavior will be exhibited by a blind pedestrian in each travel situation to determine yielding rate. Sites will include a range of urbanicity within Michigan. Data will demonstrate how common head and gaze related behaviors compare to previous results on cane and larger body movements impact yielding. By collecting data at both lighted intersections and roundabouts, we will be able to assess relative merits of pedestrian behaviors for free flowing and stopped traffic. The outcomes will have major implications for O&M instruction. Orientation and mobility instructors will have definitive suggestions for blind pedestrians in how they can behave to reduce risk in some of the most risky travel situations. There is also a huge potential benefit for pedestrians who are both deaf and blind. These pedestrians often cannot reliably see or hear traffic and so must rely on their behavior to consistently impact traffic in a set manner.

## [1-2] Better long cane design and biomechanics for blind cane users

Dae Kim, Associate Professor
Blindness and Low Vision Studies, Western Michigan University

The purpose of this study was to examine the biomechanical and ergonomic factors related to drop-off and obstacle detection with the long cane. Participants detected drop-offs at a significantly higher percentage when they used the constant contact technique (78%) than when they used the two-point touch technique (62%), $p < .001$. Constant contact technique's advantage over the two-point touch technique was significantly larger for the less experienced cane users (difference of 26%) than for more experienced cane users (difference of 13%), $p = .001$. In addition, constant contact technique's advantage over the two-point touch technique changed little even when the constant contact technique was used with the marshmallow roller tip (77%) while the two-point touch technique was used with the marshmallow tip (62%), $p < .001$. The cane length difference of 10" did not have a significant effect on drop-off detection performance. As for obstacle detection, the constant contact technique had an advantage over the two-point touch technique for detecting shorter obstacles, but not for taller ones. Even for taller obstacles (5", 7"), the participants still missed 1 out of 3 times regardless of the technique. The findings of the study may help cane users and orientation and mobility specialists select appropriate cane techniques in accordance with the cane user's characteristics, availability of training time, and the nature of the travel environment.

### [1-3] Leveraging the General Transit Feed Specification (GTFS) for Research, Workforce Development and Technology Transfer

Scott Smith, Assistant Professor,
Geography, Western Michigan University

This session builds on recent reports, research and applications to imagine new ways in which GTFS open data may be used to advance key goals of the TRCLC. The session will include: (1) an introduction to GTFS; (2) how the GTFS has enhanced the visibility and usability of transit data; and (3) the potential for employing the GTFS to enhance passenger information; service planning and multi-modal accessibility analyses in partner communities. Also considered will be ways in which the GTFS (and associated data) can be integrated into classroom exercises and community outreach as a way to enhance both workforce and professional development.

### [1-4] The Use of a Gateway R1-6 Sign Configuration to Increase Yielding to Pedestrians

Ron Van Houten, Professor
Psychology, Western Michigan University

Increasing motorists' yielding of the right of way to pedestrians in crosswalks reduces the number of collisions between motorists and pedestrians. In this study we examined a gateway in-street sign configuration (1 in-street sign installed between the 2 travel lanes in each direction, and 1 on both edges of the roadway in each direction) on multilane roads. The first experiment compared the efficacy of adding multiple in-street signs used in a gateway configuration with a single sign between the 2 travel lanes in each direction. The second experiment compared the in-street sign gateway configuration with a more expensive pedestrian hybrid beacon. The third experiment compared the gateway in-street sign configuration with the more expensive rectangular rapid flashing beacon. The results demonstrated that the gateway in-street sign configuration produced very high levels of driver yielding, and that it was as effective as the 2 more expensive treatments.

### [2-1] Raising Awareness of Patterns in Health Outcomes: Disparities in Poor Birth Outcomes in Southwest Michigan

Authors: Virginia VanderVeen[1,2], Benedict P. Dormitorio[3], Kathleen Baker[1,2], Rajib Paul[1,3], Amy B. Curtis[1,4], Alberta Griffin[1,4,5], Catherine L. Kothari[1,4], Annie Wendt[1,6]

1. Health Data Research, Analysis, and Mapping (HDReAM) Center, Western Michigan University
2. Department of Geography, Western Michigan University
3. Department of Statistics, Western Michigan University
4. Interdisciplinary Health Sciences PhD program, Western Michigan University
5. Calhoun County Health Department
6. Kalamazoo County Health and Community Services

Livable communities should provide equal access and opportunity for all segments of their population. We, faculty and students in the College of Arts and Sciences and Health and Human Services as well as the Kalamazoo and Calhoun county health departments, represent a new interdisciplinary center for Health Data, Research, Analysis and Mapping (HDReAM) with the goal of making our communities more livable by raising awareness of health disparities and spatially assessing the quality of proposed

targeted intervention locations. In our region, poor birth outcomes, including low birth weight, prematurity, and death, are a source of concern. In southwest Michigan the disparity in infant deaths between African Americans and the white population is twice the national average. We used geographic information systems (GIS) and geospatial statistics to examine poor birth outcomes in Kalamazoo and Calhoun counties using three years of data from the Michigan Vital Records. High risk areas were identified, and compared to one another in terms of maternal behaviors and health characteristics. These patterns were also compared with standard demographic datasets that are commonly used in public health to predict high risk. We describe new methods for reducing uncertainty in studying these patterns. Geostatistical modeling included a mixture of point mass at low birth-weight category and Gaussian distribution on the rest. The mean functions used were a linear combination of demographic and socioeconomic variables. These models also incorporated individual, as well as, census tract level spatial random effects. Models were fitted to data using a Markov Chain Monte Carlo algorithm and Bayesian inferences were drawn based on the samples generated from this algorithm. We also plan to demo a draft version a new community health interactive website to raise awareness of community assets, access, and disparities in Kalamazoo and Calhoun counties.

## [2-2] Exploring Opportunities for Engaging Public Health in Transportation Planning

Jianling Li, Colleen Casey, Urban Public Affairs, University of Texas at Arlington,
Lou Brewer, Tarrant County Public Health

Engaging the public health community in the regional transportation process is critical in order to fully address the broader community level effects of transportation development. For example, interventions in the built environment can facilitate non-motorized forms of travel or create safe places for community residents to walk or engage in physical activity. Likewise, through greater connectivity and transportation alternatives can enhance resident's access to hospitals or other institutions providing medical care. Despite the recognition of such importance, questions remain as to what challenges and opportunities exist in engaging public health organizations in transportation planning to inform these decisions. This study attempts to discover the causes of disconnection between the two professions in achieving overall sustainability from a network, multi-centric organizational perspective. This study is also a test of network theory in its applicability to a specific field of public work that is beyond the conventional realm where network theory has been applied. The findings have practical implications for those responsible for facilitating collaboration across the nation in regions that share similar transportation and public health challenges.

Significant changes have been made in the past several decades in the transportation planning process and infrastructure development. Since the passage of the National Environmental Policy Act (NEPA) of 1969 and subsequent major transportation and environmental legislations, much attention has been given to environmental impacts of transportation planning and infrastructure development. There have been guidelines on processes, procedures, methods and best practices to assist state Departments of Transportations (DOTS) and Metropolitan Planning Organizations (MPOs) to consider environmental factors in transportation planning and to meet the NEPA conformity requirements. However, most environmental factors have been limited to impacts of transportation on air and water quality, noise, wildlife, wetland and social equities. Much remains to be known about the health impacts of transportation. While research has recognized the role of transportation in health outcomes and called for collaborative action between transportation and public health communities, there remain challenges to engaging the two professional communities in collaboration.

Drawing upon scholarly work in network theory and organization collaboration, we explore collaboration barriers and opportunities between the two communities. Specifically, we ask: what

collaboration barriers and opportunities exist in engaging the public health community in the regional transportation process? We address these questions using a mixed-methods approach. We conducted a content analysis of the primary and secondary data gathered from a focus group interview of leaders in both communities in the Dallas/Fort Worth (DFW) Metroplex and 43 successful cases of collaboration nationwide. Based on the findings from the content analysis, we designed an Internet survey and analyzed the data from the survey. The DFW area was selected for this research because it is an area where both communities are facing significant transportation and public health challenges, and there are few formal regulations requiring the involvement of the public health community in the transportation planning process.

## [2-3] Emission Performance Measures/ Indicators

Stephen Mattingly, Associate Professor
Civil Engineering, University of Texas at Arlington

Performance measures or indicators are scientific and systematic assessment tools generally used by governmental agencies for selecting appropriate projects or evaluating projects. Emission performance measures, also, are utilized to measure the quality of ambient air conditions. Many States have developed them to assess the status and trends of ambient air conditions. The emission performance measures may be a set of trend data or scored data within a period of exposure time that should indicate the system condition. For example, a roadway network should maximize flow, while minimizing on-road emissions. The emission performance measures should assist transportation planners in evaluating the impacts of transportation projects resulting in an impact on emissions. In addition, emission performance measures should be beneficial for the planning process in the long term.

A good emission performance measure should be practical and realistic. It should be easy to understand for all people and easy to develop with available data. Moreover, it should be provided in time, so the users, such as travelers or government, still have time to react to the air pollution condition. For example, an emission performance measure, such as the air quality index (AQI), can provide air quality information along the roadway network so that travelers will know the air quality condition and try to avoid routes with high air pollutants. In addition, the Department of Transportation (DOT) can use emission performance measures to evaluate project implementation and future funding allocations.

Input measures are defined as the resources used in producing an output or outcome, while output measures are defined as the products or services from the activities or programs. Outcome measures are defined as the occurrence, condition, or consequence of activities or programs. Service measures are defined as a measurement of the user's satisfaction. Cost effectiveness measures are defined as a measurement of activity or program success.

This presentation focuses on the outcome measures (emissions generated from vehicles). The outcome measures are first divided into two levels based on spatial and temporal applicability, tactical level and strategic level. The outcome measures at the tactical level (response planning) should enable to access the impacts of emission in a short period of time and in a particular area, such as corridor, and local. On the other hand, outcome measures at the strategic level (long term planning) should enable to evaluate overall impacts of emissions in the long term in wide area such as regional. At tactical level, the outcome measures should access the air quality in particular area such as intersections or on-ramp freeways. In addition, it should enable to access the impacts of emission due to accidents or incident events on freeways. At the strategic level, the outcome measures should assess the condition or well-being of people in the region, or state, or the long-term results of different government programs, such as vehicle retirement, new alternative fuels, and low emission vehicles.

### [2-4] Using Behavioral Attributes to Assess Pedestrian and Bicyclist Safety

Timothy J. Gates, Ph.D., P.E., P.T.O.E., Associate Professor
Civil and Environmental Engineering, Wayne State University

Safety performance functions (SPFs) provide a promising approach for quantifying the level for pedestrian crashes at specific intersections or road segments. The Highway Safety Manual currently provides an aggregate pedestrian/bicycle SPF, which is based upon land use characteristics. Research is limited in terms of disaggregate-level studies considering the effects of motor vehicle/bicycle/pedestrian volumes, roadway geometry, and other factors on pedestrian and bicycle crashes. Furthermore, research has been limited with respect to how these factors influence the underlying behaviors of both motorized and non-motorized road users. To address these issues, this research will involve the development of SPFs, which can be used to estimate the frequency of pedestrian- and bicyclist-involved crashes on a site-specific basis. These SPFs will also assist in quantifying the effects of various factors (e.g., volumes, speeds, roadway features) on the crash risk for non-motorized users. The utility of these SPFs will be supplemented through a series of field studies to ascertain differences in driver, pedestrian, and bicyclist behavior at locations with varying traffic volumes and roadway geometry. As site-specific crash data are relatively limited for non-motorized users, a series of surrogate safety measures will be assessed (e.g., traffic conflicts, yielding behavior/compliance, lateral placement of motorists, etc.) in an attempt to better understand the relationship between safety risk and the aforementioned site factors. Ultimately, the results of these efforts will provide important guidance for road agencies toward proactive safety management practices for non-motorized users. This study, which is currently in the early stages, will involve collaboration between researches from Western Michigan University (WMU), Tennessee State University (TSU), and Wayne State University (WSU).

### [2-5] Survey on Benefits of MDOT's Intelligent Transportation Systems

Matthew Clark, Graduate Student, Civil and Construction Engineering, Western Michigan University

Western Michigan University's (WMU) Transportation Research Center for Livable Communities (TRCLC) is currently evaluating the performance of the Michigan Department of Transportation's (MDOT) Intelligent Transportation System (ITS) deployments. An integral component of this project consists of determining the level of user satisfaction resulting from ITS in Michigan. The research team accomplished this objective through administration of a user perception survey. The survey was accessible online at the link http://mdot.itssurvey.questionpro.com, with responses gathered during a time period spanning December 16, 2013 through June 30, 2014. During this period, 1,278 surveys were completed out of 1,712 surveys started, resulting in a 75 percent completion rate.
MDOT's ITS deployments include devices and applications such as Closed Circuit Television Cameras (CCTV), Dynamic Message Signs (DMS), Freeway Courtesy Patrol (FCP), the Mi Drive real-time traffic information website and others. Survey questions were specifically tailored to determine the usage frequency, appropriateness of disseminated information and effectiveness of certain ITS deployments from the user's perspective. Some example questions include:

- How long would you be willing to wait for the FCP service?
- How trusting are you of the information displayed on DMS?
- How often do you typically obtain travel information from the following sources before your departure (Mi Drive site, Smartphone apps, Other websites, Television and Radio)?

The study presentation begins with a thorough summary of previously conducted surveys related to ITS performance in Michigan, as well as other areas. Following the literature review, the purpose and structure of the questionnaire are explained. The results of the survey are introduced and compared with

the findings of previous surveys evaluating MDOT ITS conducted by researchers at Cambridge Systematics, Inc. and Wayne State University in 2011 and 2012, respectively. A key defining characteristic of the present WMU survey is the timespan of response collection, which ranges multiple months, allowing for analysis of variation in responses according to seasonal changes. Additionally, the present survey is the first to query user's level of satisfaction with MDOT's FCP service. Finally, recommendations are made towards enhancing MDOT's ITS deployments and Transportation Operation Center (TOC) performance according to the expectations and perceptions of Michigan motorists.

### [3-1] Non-Motorized Transportation Initiatives and Programs at the Western Michigan University Office for Sustainability

Luis Morales-Espinal and Dough Ladner, Intern
Office for Sustainability, Western Michigan University

The mission of the Office for Sustainability is to guide and assist the Western Michigan University community in fulfilling and growing its sustainability commitments. To help WMU promote a culture of sustainability, we lead non- motorized transportation programs and initiatives that include planning, education, and action research on campus and in the community. Main campus accommodates 5,500 or more students every day, but bicycle traffic is very low, even during ideal weather. With our programs we encourage people to make more sustainable daily transportation choices, and we continually seek opportunities for improving campus infrastructure and community connections. Program highlights include: bike safety, group rides, and open shop night - a peer-to-peer bike maintenance program, and research highlights include: best practice studies of bike friendly universities, bikeshare options, and shared use pathways on campus. The next step is to develop bike rental pilot and bike friendly university application in Fall 2014.

### [3-2] Simulation Model for Analyzing Bicycle Friendly Kalamazoo Downtown

Marino Calderón Díaz, Graduate Student
Civil and Construction Engineering, Western Michigan University

Complete Traffic simulation of the Western Michigan University campus and Downtown Kalamazoo in order to propose changes traffic and urban design. The main purpose of this project is to incorporate the concept of roundabouts and complete streets in the city of Kalamazoo. This project is looking to provide wider sidewalks for pedestrians, bicycle lanes, transit priority, and beautiful landscape. Bicycles is a means of transportation and the city of Kalamazoo lacks a safe path for bicyclists to use, this project will be looking into creating a loop around the city for them to travel. The traffic simulation will be done using the powerful simulation software called PTV VISSIM. PTV VISSIM is rounded off with comprehensive analysis options, creating a powerful tool for the evaluation and planning of urban and extra-urban transport infrastructure (PTV Group, 2014).

### [3-3] Alternatives for Providing a Safe Passage for Non-Motorized Traffic Across an Existing Highway Bridge – Research Needs and Methodology

Upul Attanayake, Ph.D., P.E., Associate Professor
Lizmert Lopez Gonzalez, Graduate Research
Civil and Construction Engineering, Western Michigan University

Non-motorized transportation increases mobility choices, relieves congestion, promotes local economy, reduces greenhouse gas emission, promotes a healthy lifestyle and improves quality of life. Recently, there is an emphasis on developing integrated transportation systems with off-road shared use paths and on-road facilities. Hence, non-motorized plans are developed through a collaborative effort by state highway agencies, counties, cities, townships, various other agencies and departments, and the communities. One of the major challenges of developing integrated transportation systems is providing a safe passage for non-motorized traffic across an existing highway bridge. Geometry, adjacent land use, and existing traffic conditions are a few leading factors when the deck or superstructure replacement or bridge reconstruction is not an option. A majority of the published non-motorized transportation plans does not provide clear guidelines or methodologies for integrating existing bridges into the non-motorized facilities when different conditions exist. The presentation will explain the research methodology that will be implemented for identifying alternatives to provide a safe passage for non-motorized traffic across an existing highway bridge.

### [3-4] A Study on Bicycle Safety

Hamidreza Ahady Dolatsara, Graduate Student
Civil and Construction Engineering, Western Michigan University

This study investigates the factors which affect the safety of cyclists within the influence area of intersections to enhance development of bike safety performance functions (SPF). The scope of this study is limited to the four Michigan cities of Ann Arbor, East Lansing, Flint and Grand Rapids. Due to the current lack of research regarding the appropriate size of the influence area, this study investigates the distance of crashes relative to the center of 148 intersections to identify the most probable area of influence for bike crashes throughout the analysis period and proposes 137 radius ft. The proposed area of influence is adopted for building the spatial database and developing the SPF. Crash data (from 2008 to 2012) and geometric and exposure characteristics (ADT, bike volume) of the intersections are investigated to develop the SPF. ArcGIS 10.0 is utilized to build a spatial data base from the crash data, as well as the geometric and the exposure characteristics. Results of the bike SPF demonstrate that exposure, presence of bicycle lanes, presence of bus stops and the number of left-turn lanes at intersections are positively associated with bicycle crashes. A structural equation model (SEM) is developed to decipher complex interrelationships among the variables affecting bike crash frequency. Results show that although the presence of bicycle lanes is significant in increasing bicycle crash frequency, bike lanes are correlated with bicycle volume, thus bicycle lanes do not endanger bicycle safety.

### [3-5] Road Users' Hazardous Actions: Evidence from Michigan Crash Data

Elisha Wankogere, Graduate Student
Civil and Construction Engineering, Western Michigan University

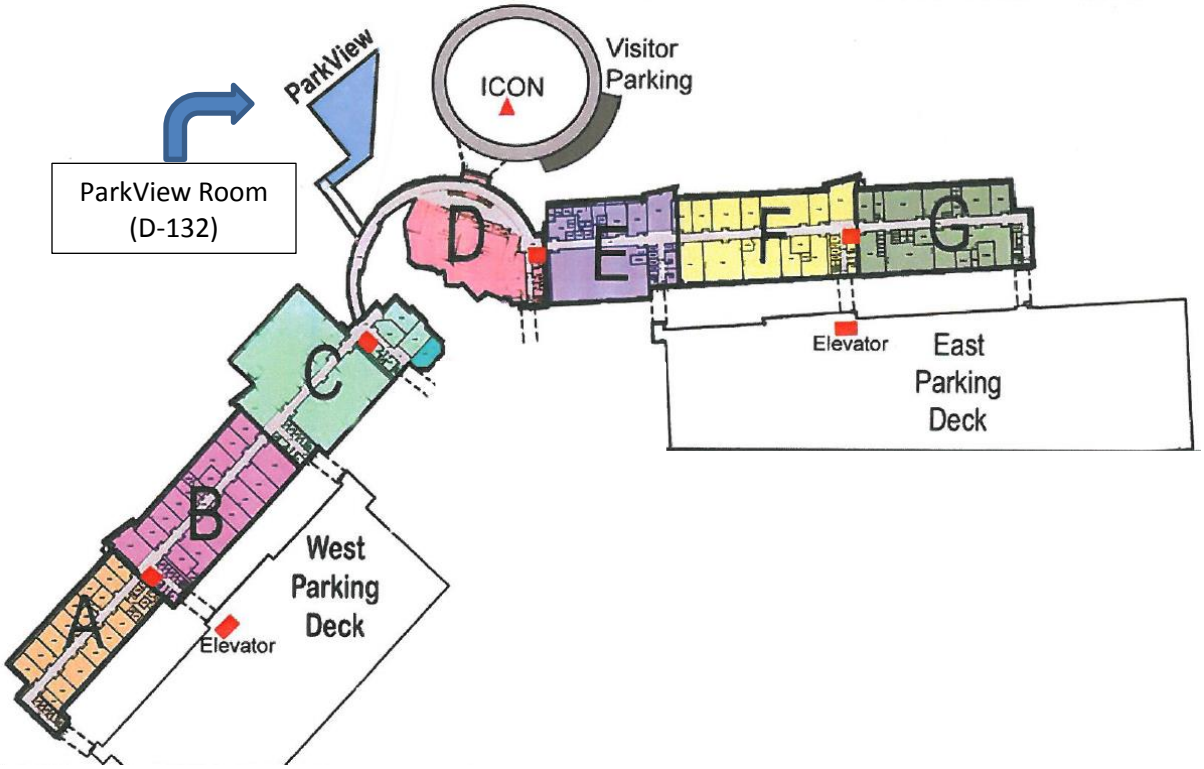
Road users' actions are among the major contributors to crashes. While the condition and characteristics of roadway, traffic, driver, pedestrian, bicyclists and environment are also determinants of crash outcomes, road users' actions before the accident influence crash severity outcomes. Using three years (year 2009–year 2011) crash data from Michigan, this study examines the relationship of more than fifteen hazardous actions by drivers, pedestrians and bicyclists on crash injury severity in relation to roadway, environmental, traffic and other characteristics. These results will help law enforcement officers, roadway designers, and the public in their efforts to reduce fatality and seriousness of crashes.

## Attendees

| Last Name | First Name | University | Department |
|---|---|---|---|
| Abudayyeh | Osama | WMU | Civil and Construction Engineering |
| Acosta Rodriguez | Lusanni | WMU | Civil and Construction Engineering |
| Ahady Dolatsara | Hamidreza | WMU | Civil and Construction Engineering |
| Al-Fuqaha | Ala | WMU | Computer Sciences |
| Atta Boateng | Richard | WMU | Civil and Construction Engineering |
| Attanayake | Upul | WMU | Civil and Construction Engineering |
| Baker | Kathleen | WMU | Geography |
| Calderón Diaz | Marino | WMU | Civil and Construction Engineering |
| Casey | Colleen | UTA | Urban and Public Affairs |
| Cho | Hyunkeun | WMU | Statistics |
| Clark | Matthew | WMU | Civil and Construction Engineering |
| Curtis | Amy | WMU | Health Data Research, Analysis and Mapping Center |
| Emerson | Robert | WMU | Blindness and Low Vision Studies |
| Gates | Timothy | WSU | Civil and Environmental Engineering |
| Glasser | Harold | WMU | Office for Sustainability |
| Guth | David | WMU | Blindness and Low Vision Studies |
| Jorge | Randy | WMU | Civil and Construction Engineering |
| Kim | Dae | WMU | Blindness and Low Vision Studies |
| Kohler | Paula | WMU | Office of Vice President for Research |
| Kwigizile | Valerian | WMIU | Civil and Construction Engineering |
| Ladner | Douglas | WMIU | Office for Sustainability |
| Litynski | Daniel | WMU | Office of Vice President for Research |
| Long | Richard | WMU | Blindness and Low Vision Studies |
| Lopez Gonzalez | Lizmert | WMU | Civil and Construction Engineering |
| Mattingly | Stephen | UTA | Civil and Construction Engineering |
| Morales-Espinal | Luis | WMU | Office for Sustainability |
| Oh | Jun | WMU | Civil and Construction Engineering |
| Paul | Rajib | WMU | Statistics |
| Ro | Kapseong | WMU | Mechanical and Aerospace Engineering |
| Savolainen | Peter | WSU | Civil and Environmental Engineering |
| Smith | Scott | WMU | Geography |
| Van Houten | Ron | WMU | Psychology |
| VanderVeen | Virginia | WMU | Geography |
| Wankogere | Elisha | WMU | Civil and Construction Engineering |
| Yang | Li | WMU | Computer Sciences |

# Maps


**ParkView Campus**




**Meeting Room (ParkView)**