



# KITTELSON LLC

FORENSIC TRANSPORTATION ENGINEERING

**HERMANUS J STEYN, PR.ENG., P.E.**  
PRINCIPAL ENGINEER

## EDUCATION

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- B.Eng. in Civil Engineering, University of Stellenbosch South Africa, 1991

## PROFESSIONAL STATUS: LICENSES

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- Professional Engineer, South Africa, No. 970148
- Professional Engineer, State of Oregon, No. 72517
- Professional Engineer, State of Washington, No. 43046
- Professional Engineer, State of Idaho, No. 13284
- Professional Engineer, State of Utah, No. 7104957-2202
- Professional Engineer, State of California, No. C 75331
- Professional Engineer, State of Montana, No. 58579
- Professional Engineer, State of Tennessee, No. 122758

## PROFESSIONAL ASSOCIATIONS

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- Institute of Transportation Engineers (ITE), Member
- Women's Transportation Seminar, Member
- Transportation Research Board (TRB), Geometric Design Committee AFB10, Chair (2018-2020)
- TRB, Performance Effects of Geometric Design Committee AKD10, Co-Chair (2020-2023)
- TRB, Performance Effects of Geometric Design Committee AKD10, Chair (Current)

## PROFESSIONAL EXPERIENCE

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### SENIOR PRINCIPAL ENGINEER, KITTELSON & ASSOCIATES, INC.

**2001 – Present**

Conducted transportation impact analyses for future developments dealing with safety issues, access management, and on-site circulation for a variety of developments. For these analyses, managed the projects, coordinated with project teams, provided input to site plan circulation, determined new traffic associated with development, determined future growth, assigned new traffic from development to the transportation system, conducted existing and future traffic operations analysis, determined off-site improvements, documented findings in report, and testified at public hearings for project approvals.

Prepared a variety of transportation studies for all types of roadways—from local streets to freeways. On such projects, managed the projects, coordinated with project multidisciplinary teams, conducted existing and future traffic operations analysis. Further, developed preliminary transportation improvements (i.e., horizontal functional layouts accounting for vertical alignments) considering impacts to natural resources, constructability, phased implementation opportunities, intersection traffic control, and cost estimating in establishing the appropriate improvements. In closing, prepared technical memorandums and reports to

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document findings, as well as testified at city council and/or county board of commissioners for study adoptions.

Managed numerous design-related projects, served as engineer of record, and provided quality assurance/quality control (QA/QC) on many transportation improvement projects. On these projects, prepared final roadway, traffic signal (new and modifications), detector (loops, video, radar) and interconnect (fiber) plans, roadway signing, pavement markings, street lighting and traffic control (maintenance of traffic) plans based on various state and local agency design standards. On projects featuring these engineering aspects, prepared special provisions for standard specifications, and engineering estimates; assembled construction documents for bidding purposes; as well as provided office support inspection during construction.

Managed, prepared, and developed design guidance and criteria as part of national publications for National Academies and Federal Highway Administration (FHWA). Updated State Departments of Transportation (DOTs) and local agencies (cities and counties) design manuals and/or guidelines to integrate performance-based design and context classifications.

On a national level, currently serves as the chair of the Transportation Research Board (TRB) Performance Effect of Geometric Design Committee, AKD10.

#### **CHIEF ENGINEER, BKS CONSULTING ENGINEERS PTY. LTD. SOUTH AFRICA**

**1993 – 2000**

Responsible to design all multidiscipline elements associated with subdivisions, such as three-dimensional (3D) on-site grading (e.g., balancing earthworks), stormwater drainage (inlet placement and number), waterlines, sewer lines, power, and telephone, as well as developing project specifications and estimates. Assembled construction documents for bidding purposes, evaluated potential contractors' bids, recommended preferred contractors, and then provided construction supervision of the design elements responsible for.

Participated in traffic operations studies (e.g., master planning) by collecting data in the field (e.g., observing non-motorized and motorized user behavior), processing data for analyses (e.g., developing spreadsheets), conducting traffic operations analyses, developing preliminary roadway layout designs to address the operational needs, and then consider constructability and developed phased implementation strategies.

Responsible for the roadway design components on numerous multidiscipline engineering transportation projects, coordinating with other disciplines, developing 3D models for roadways (horizontal, profile, and cross section), prepared roadway, stormwater, traffic control design plans, developed specifications and quantifies for estimates, as well as engineering estimates. For these projects, also responsible for assembling construction documents for bidding purposes, evaluating potential contractors' bids; recommending preferred contractors, and then provided construction supervision of the design elements, responsible for. In addition, served fulltime on a construction site for 12 months during the construction of a large divided highway project through a mountain pass.

#### **ACADEMIC COURSES TAUGHT**

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- 2007 – 2013: Senior Design Class, University of Portland
- 2012 – 2013: Capstone Project, Portland State University
- 2018 - 2019: Fundamental Engineering Classes, University of Portland

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## EXPERT WITNESS ACTIVITIES

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Assisted attorneys in private practice, insurance companies, and government attorneys, in tort cases filed in the states of Washington, and Oregon. Analyzed roadway design and the design and operation of traffic control devices, including traffic signals, to determine if their presence or absence contributed to or caused an accident.

## SELECTED PUBLICATIONS/MANUALS/GUIDES

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### NATIONAL PUBLICATIONS:

#### **NCHRP Report 707: Guidelines on the Use of Auxiliary through Lanes at Signalized Intersections**

Kittelson & Associates, Inc. (Kittelson) was the prime contractor for this project which produced guidelines for the operational analysis, safety analysis, and design of auxiliary through lanes (ATLs) at signalized intersections. Hermanus was the geometric Design Task Leader and prepared design guidelines to assist practitioners in determining key design variables for ATLs. The final report includes recommendations for incorporating the ATL operational models within the Highway Capacity Manual and conforms with current standards and guidance in the Manual on Uniform Traffic Control Devices and the AASHTO Greenbook.

#### **FHWA Alternative Intersections/Interchanges Informational Guides**

Kittelson led a team to develop four alternative intersection information guides for the following forms: Displaced Left-Turn Intersection, Restricted-Crossing U-Turn Intersection, Median U-Turn Intersection, and Diverging Diamond Interchange. Kittelson coordinated with national topic area experts to develop material to augment and expand upon prior FHWA published alternative intersection and interchange reports. A key focus is applying research results addressing multimodal users, traffic operations, and safety performance for each intersection forms. Kittelson created and delivered two webinars to help educate practitioners and professionals in making decisions about using these types of alternative intersections, including how to assess these types of facilities in areas of geometric design, operations, safety, and multimodal considerations. Hermanus was the lead author for the Displaced Left-Turn Intersection Informational Guide, as well as peer reviewed Geometric Design; Signal, Signing, Markings, and Lighting; and Construction and Maintenance chapters of the other guides.

#### **FHWA Accelerating Roundabout Implementation in the US**

Roundabouts have been demonstrated both in research and in practice to be proven options for intersection design, and their safety and operational performance in many cases is superior to other alternatives. Federal Highway Administration (FHWA) has included roundabouts as one of nine proven countermeasures. Kittelson conducted research for FHWA on seven time-critical topics as impediments to use of roundabouts in the United States as part of this project:

- Assessment of rectangular rapid flashing beacons for addressing accessibility of multilane roundabouts;
- Assessment and potential recalibration of the HCM 2010 capacity model for roundabouts using a new set of national data;
- Development of air quality and noise predictive tools for roundabouts; and
- Analysis of fatal and severe injury crash patterns at roundabouts.
- Evaluation of geometric parameters for trucks
- Assessment of crosswalk location and design
- Assessment of traffic control device treatments at multilane roundabouts.

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Kittelton staff served as the overall technical Principal Investigator and leader of the capacity, accessibility, and safety tasks, with contract management from Virginia Tech Transportation Institute and leadership on other tasks from ITRE. Hermanus led the “Forensic Analysis and Investigation of Severe Crashes at Roundabout” task that included a detailed analysis of fatalities throughout the US and a quantitative assessment of injuries of two State Departments of Transportation. In addition, he was actively involved with the evaluation of geometric parameters for trucks.

**NCHRP Report 926: Guidance to Improve Pedestrian and Bicycle Safety at Intersections**

Kittelton was a member of the National Cooperative Highway Research Program (NCHRP) research team to develop guidance for transportation practitioners for improving pedestrian and bicycle safety at intersections through design and operational treatments. We conducted an exhaustive literature review and practitioner outreach effort to understand the current state of the practice in designing intersections for pedestrians and bicyclists. We also collected available data from cities and states across the United States to analyze safety performance of different treatment types. A central component of the research is to review and analyze the operational and safety performance of protected intersections. Kittelson led the design and execution of the protected intersection analysis, including video data collection and reduction at two protected intersections (Berkeley, California and Salt Lake City, Utah), as well as a comparison site for each intersection. The results of this analysis will inform protected intersection design and implementation guidance nationwide. As Kittelson's project principal, Hermanus provided guidance for the overall approach and conducted quality review of the final report.

**NCHRP 20-07: Task 423 Planning for a Comprehensive Update and Restructuring of AASHTO’s A Policy on Geometric Design of Highways and Streets (Green Book, 8th Edition)**

Kittelton led the development of a vision and roadmap, which is the framework for outlining and developing the GB8 content. Hermanus conducted quality review of the literature review, outreach summaries, an annotated outline for the GB8, and contributed to establishing the Green Book, 8th Edition Vision & Roadmap, which supports a data-driven and performance-based design approach.

**NCHRP Project 15-77: Aligning Geometric Design with Roadway Context**

Building upon the work completed for NCHRP 20-07, Task 423 Planning for a Comprehensive Update and Restructuring of AASHTO’s Green Book, 8th Edition, Hermanus served as a Senior Technical Advisor investigating how to reorganize the Green Book guidance by context class. This involved outreach to practitioners, synthesizing information, and drafting the Green Book, 8th Edition Part IV. Outreach activities included meetings with the AASHTO Technical Committee on Geometric Design and workshops with the National Association of City Transportation Officials, Institute of Transportation Engineers, Association of Metropolitan Planning Organizations, and Association of Pedestrian and Bicycle Professionals. Kittelson conducted focus group meetings with 12 agencies to understand their context-based design practices. The team has also conducted a literature review for potential content to understand considerations for the range of potential user vehicles from micro-mobility to large trucks. To identify ways to reorganize Part IV chapters, the team synthesized approaches and developed a Part IV Draft Chapters Annotated Outline. Having users understand the elements of Parts I through III allows Part IV to have specific considerations of integrating context classification into roadway planning and design. Part IV will apply principles and guidance from Parts I to III to each context and describe the qualities and characteristics of each context classification. Part IV will include design value ranges for facility types for each context.

**NCHRP Project 15-72: Identification of AASHTO Context Classification**

Hermanus led Kittelson’s support to the team with identifying AASHTO context classifications for the Green Book 8th Edition. He participated in work sessions, reviewed content, and produced draft information associated with understanding the context classification characteristics and design guidance

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integration. He also developed practical guidance to identify appropriate context classification(s) for an area or project.

**NCHRP Research Report 1036: Roadway Cross-Section Reallocation: A Guide**

After conducting practitioner interviews, a literature review, and original research into the operational impacts of roadway reallocation projects, the Hermanus served as the Senior Technical Advisor on the team that produced NCHRP Research Report 1036: Roadway Cross Section Reallocation: A Guide and a decision-making spreadsheet tool. This guidance document provides a decision-making framework that can be applied at each stage of the project development process; incorporates transportation and non-transportation outcomes of reallocating cross sections; uses a performance-based design approach; and includes performance measures to support decisions throughout project development. Safe System Approach principles infuse the guidance, and the framework considers outcomes related to transportation, livability, economic and environmental health, equity, and other concerns.

**FHWA: Design Decision Documentation and Mitigation Strategies for Design Exceptions**

Since 2007, there have been changes in FHWA's controlling design criteria and in the project development philosophies of many departments of transportation (DOTs). These changes have resulted in State DOTs shifting from standards-driven design toward context-based and performance-based decision-making, all of which can add value for road users and flexibility during project development. Design Decision Documentation and Mitigation Strategies for Design Exceptions provides information to transportation practitioners, especially planners and designers, about FHWA's 10 controlling criteria, their impacts on safety and operations, the inter-relationships with other controlling criteria, and potential mitigation strategies for design exceptions. The report also includes an overview of concepts such as nominal and substantive safety, performance-based and context-based design, equity in transportation, Complete Streets, transportations systems management and operations (TSMO), Safe System Approach, risk management and tort liability fundamentals, and design documentation practices. Hermanus served as the Senior Technical Advisor on the project team.

**STATE /LOCAL AGENCY GUIDANCE:**

**Bicycle Facility Design Toolkit: Washington County, OR**

Hermanus served as Project Principal for an effort to develop a Pedestrian and Bicycle Design Toolkit that will serve as a resource for selecting and designing appropriate non-motorized facilities along roads throughout Washington County, OR. At the start of the project, the County was unprepared to adopt the best practices for pedestrian and bicycle facilities that have emerged over the last five years as their road standards could not accommodate them. The Bicycle Design Toolkit describes an agreed-upon set of roadway conditions that will support new pedestrian and bicycle treatments for a variety of users. Kittelson's technical work included developing a decision matrix for choosing when to consider a variety of new treatments such as sidepaths or cycletracks and developed typical cross sections that incorporate off-street paths or tracks in the right-of-way. As part of the culminating effort, Hermanus facilitated an extensive stakeholder engagement program and conducted staff training on use of the Toolkit. As a follow-up, Hermanus co-authored a White Paper that provides summaries of literature that document the trade-offs of reducing lane width and provides empirical support for small variations from standard widths based on decisions that balance mobility targets, safety goals, and design user needs of each roadway.

**Vancouver Bicycle Planning and Design Guide: Vancouver, WA**

Kittelson developed the Bicycle Planning and Design Guide that provides a summary of current design guidance and research related to bicycle facility selection and design as well as a discussion of current research on vehicular lane widths and their impacts on safety, operations and various user types. The guide is divided into three parts that provides guidance for the following:

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- Bicycle facilities and network needs
  - Applying appropriate vehicle lane widths based on context
  - Applying principles in the design process in Vancouver

This guidance is intended to assist City of Vancouver planners and engineers with selection of appropriate street designs now and in the immediate future and embracing their Complete Streets policy. This project was completed through the City's On Call contract, where Hermanus serves as the Contract manager. For this work order, he integrated his national experience in the preparation of guides and manuals and served as the Project Principal.

#### **Montana Department of Transportation Road Design Manual**

Hermanus led the team and was an author for the new updated Montana Department of Transportation (MDT) Road Design Manual. Kittelson developed a table of contents for the new Road Design Manual; developed white papers on key road design topics for consideration in the new Road Design Manual; developed an annotated outline for the new Road Design Manual; and wrote a sample draft chapter for the new manual. Kittelson then led workshops with MDT staff to gather input and work collaboratively to generate design material that reflects current design research, updated project development processes, and best practices for road design. One key component of the update was, to incorporate a performance-based road design approach into the road design project development process that enables designers to make informed decisions about the performance tradeoffs. Key new and updated chapters in the manual include, Road Design Policies and Procedures (i.e., Performance Based Design), Multimodal Design Considerations, and Urban Design Considerations.

#### **Oregon Department of Transportation: Blueprint for Urban Design**

Hermanus led and managed the Urban Design Initiative for Oregon Department of Transportation (ODOT) that establishes new urban design guidance and standards throughout the state. The first phase of the project included an audit of ODOT manuals as they relate to urban design, as well as conducting stakeholder outreach activities. The second phase included; developing three topical memorandums addressing key urban design challenges (i.e., Bicycle Facility Design Selection, Pedestrian Crossing Spacing, and Target Speed), providing an implementation plan of how to update ODOT Manuals to integrate urban design, and preparing a "bridging document" (titled, *Blueprint for Urban Design*) that establishes key urban design principles for the state by referencing best practices and tying ODOT manuals together (design, operations, and safety). Hermanus also conducted stakeholder outreach and led the development of training material for urban design guidelines training to agency staff throughout the state.

#### **Metro Designing Livable Streets and Trails**

Hermanus guided efforts to update Metro's street design guides to reflect current best practices and provide guidance on a performance-based design approach for regional streets and trails. The new *Designing Livable Streets and Trails* guide provides the linkage between the Greater Portland region's policies and vision for implementing streets based on land uses by defining project outcomes, the functions of the streets to support the communities and the intended outcomes, establishing design principles and elements to support the functions, and providing a performance-based design decision-making framework that gives practitioners the flexibility to develop community-based solutions.

#### **Tennessee Department of Transportation (TDOT) Work Zone Design Manual**

Hermanus led a team in the development of the TDOT Work Zone Design Manual. As part of the manual content development, Kittelson created an annotated outline for showing the various chapters and sections to be addressed within each chapter and developed 10 white papers about work zone design topics. The white paper topics included research and summary information on ITS work zone technology and processes for implementing smart work zones. This included identifying state of the practice information

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from other state and federal agencies regarding advances in work zone technologies and appropriate applications for devices. A key theme in the manual is to establish clear design guidance that considers project context, roadway facility types, and coordination with planning and design to execute safe and efficient projects. The manual includes eight chapters, including specific information on design decision-making, agency policy, and implementation processes for installing various traffic control devices. As part of the manual, Kittelson developed over 60 detailed design applications for various roadways and work zone scenarios. Hermans led four 6.5-hour training sessions in the respective regions of Tennessee as part of the implementation of the new Work Zone Design Manual.

#### **Oregon City Standards; Oregon City, OR**

Hermanus led a team to develop Street Design Standards for the City of Oregon City. The City's goal is to develop Street Design Standards that are specific to their communities and reflect their desired preferences in design strategies and requirements. Kittelson used a proven three-stepped approach working collaboratively with City staff by first creating a table of contents capturing a desired flow of the document, then developing an annotated outline specifying what information will be included in the various sections and what sources will be used, and finally producing the Street Design Standards based on the agreed upon annotated outline that include all the necessary details. The outcome of this project resulted in the City's first and their own standalone Street Design Standards that reflect best practices provide clear requirements for practitioners to plan and design projects within the City of Oregon City.

### **SELECTED PROJECTS**

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#### **SAFETY EVALUATIONS:**

Hermanus, as a specialized transportation engineer, has led numerous road safety audits throughout the US. He combines his expertise in traffic operations, geometric design, and road safety with his in-depth understanding of current research, traditional references, positive guidance/human factors, special users (bicyclists, pedestrians, and people with mobility impairments), law enforcement, and maintenance to complete audits that identify opportunities to improve safety and provides valuable information to assist decision makers about future safety and operation investments. When working on a road safety audit, Hermanus applies quantifiable procedures from the Highway Safety Manual to develop conceptual benefit cost ratios.

#### **Rural corridors:**

- Mt. Hood Highway (OR 26) RSA: This RSA was conducted on a 7-mile rural multilane corridor on the western slope between Portland and the Mt. Hood recreational facilities (including ski areas during winter season).
- Cornelius Pass Road Safety Evaluation: The project explored a range of safety improvements and their associated benefit-cost outcomes on a 5-mile rural two-lane corridor.
- Lake of the Woods Highway (OR 140) RSA: The RSA developed low-cost improvements to improve safety along a 30-mile two-lane two-way rural road over a mountain pass.
- Old-Redmond-Bend Highway Road Safety Audit: This safety evaluation along this rural two-lane 14-mile corridor addresses several rural intersections and consistent treatments (signing and striping) along curves throughout the corridor.
- US97 Safety Assessment between Bend and Redmond City Limits: This safety assessment along this high-speed multilane 14-mile corridor addresses several rural intersections as well as appropriate clear zone at rock outcroppings.

#### **Rural intersections:**

The following four RSAs address safety issues at the typical rural intersections that involve low-volume intersections:

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- US26 at Dover Ln.
  - US30 at Goble and Clatskanie
  - US97 at Cherry Ln.
  - OR238 at West Main St.

#### Suburban/Transition from rural to suburban corridors:

- Safety assessment at a 250-foot curve on South End Rd.: This two-lane facility had three crashes of a similar type in the same location (i.e., road-off-the-road type crashes in a suburban area).
- US30 from Millard Rd. to Berg Rd. RSA: This two-mile multilane section is part of a five-mile safety corridor designated along US30 between Scappoose and St. Helens.
- Powell Blvd. Safety Improvements Alternatives Study: This project involved creativity that encouraged out-of-the-box thinking when developing the range of new alternatives to accommodate a variety of modes, especially bikes and pedestrians, for a one-mile, two-lane facility.
- OR47 from Pacific Ave. to B St: This two-mile, two-lane facility transitions from rural to urban and there are five stop-controlled intersections and one signalized intersection.
- Damascus SE 222nd Dr. and SE 242nd Ave. Corridors RSAs: These two approximately four-mile corridors have numerous rural intersections along the two-way, two-lane facilities. The goal was to develop a series of low-cost improvements along the corridors, as well as at the intersections.
- Stafford Rd.: Between Wilsonville and Lake Oswego City Limits: This six-mile study corridor stretches from suburban to rural and then back to suburban. Within the study corridor, there are 18 stop-controlled intersections, 4 signalized intersections, 2 roundabouts, and a number of private accesses.
- OR213/Toliver Rd RSA: A side-street stop-controlled intersection on the fringe of the city. Crashes were mostly turning- and angle-related, trying to find gaps in the highway traffic. A follow-up intersection control evaluation indicated a roundabout as the preferred alternative.
- TV Highway (OR8) from 17th Ave (Hillsboro) to 26th Avenue (Cornelius) RSA: This 2-mile road segment connects the two suburban areas of the respective city. There are numerous turning crashes at the unsignalized intersections/driveways. The goal of the RSA was to identify near-, medium, and long-term improvements to address the safety issues.

#### Urban/downtown intersections:

- OR138 Corridor Solutions RSA: This RSA was conducted within Roseburg downtown where OR138 couplet intersects with the OR99 couplet. The study area included seven signalized intersections.
- Grants Pass Interchange: The RSA involved an unconventional intersection configuration.
- Powell Blvd. from 20th Ave. to 33rd Ave.: The approximately one-mile, five-lane corridor had 77 pedestrian involved crashes of 249 reported rear-end crashes due to pedestrians stepping into the roadway.
- Barbur Blvd. RSA from SW Capitol Hwy. to SW Naito Pkwy.: The approximately 4.5-mile, 5-lane corridor had 919 reported crashes over a 10-year period, including 34-bicycle related, and 12 pedestrians.

#### Unique Evaluations:

- **Washington County OR Flashing Yellow Arrow (FYA) Evaluation:** Kittelson provided a safety review to provide of the crash history and patterns around left-turn crashes on protected/permissive flashing yellow arrow (FYA) approaches (more than 100 intersections) and develop potential enhancements for future FYA deployments.



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**PLANNING, DESIGN, CONSTRUCTION:****I-5/NW La Center Rd.; La Center, WA**

This project was the subject of a detailed interchange planning and design effort being led by Kittelson. The existing interchange was not sufficient to safely and efficiently support the near- and long-term increases in traffic volumes. As such, Kittelson led a multi-disciplinary team to study, plan, and functionally design a new interchange form and modify the nearby local roadway network. Modification of the existing northbound and southbound interchange ramp terminals include multilane roundabouts. While privately funded, the study has been closely coordinated with the City of La Center and Washington DOT to ensure standards and design expectations are being met at multiple levels of government. The Kittelson team performed the analysis and planning work in an open and collaborative manner. The public engagement process that involves exploring new roadway alignments through private properties without the power of eminent domain requires unique skills and collaboration. Kittelson used a number of innovative approaches to allow stakeholders to understand the issues and constraints, develop and evaluate feasible alternatives, and support a preferred alternative. Hermanus was the design project manager of the multi-discipline consultant team and led establishing the ultimate footprint of the proposed improvements. The Kittelson team prepared the Final Plans, Specifications, & Estimate (PS&E) package for construction and construction was completed in the Summer of 2017. This project received the 2018 American Public Works Association (APWA) Washington Project of the Year award in the \$25-75 million Transportation Category, as well as first place in the 2018 Daily Journal of Commerce (DJC) Oregon Transportation category.

**OR 213/I-205 to Redland Road Crossing, Oregon City, OR**

As project manager and engineer-of-record, Hermanus led the conceptual phase for off-site improvements associated with a large commercial development to establish a preferred jughandle configuration. More than 10 interchange concepts were developed and multiple parties were guided through the process to establish the preferred alternative. The Kittelson team prepared all the traffic operations analyses for future developments, as well as a year 2030 future conditions. In addition, Hermanus was instrumental in assisting the City of Oregon City with securing construction funding for this \$22 million project through the Jobs and Transportation Act. He also served on the multidisciplinary team taking this project through final design and construction. Kittelson led the traffic design elements by designing four new signals, one loop modification, fiber optic interconnect system, the signing & striping for the road network, the transportation management plan, and the traffic control that included a four-day closure of OR213 (expressway). Hermanus and the Kittelson team played a major role in coordinating with stakeholders, participating in public open houses, and presenting at the planning commission and/or City Council hearings. The project received the ACEC Oregon Grand Award in 2013, National APWA Project of the Year (Transportation Category \$25-75 million, and WTS Oregon Project of the Year.

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**PROFESSIONAL DEVELOPMENT COURSES TAUGHT**

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- 2-day Geometry Design Course
- 2-day Traffic Signal Design Course
- 2-day Applied Roundabout Design Course
- 1-day Safety Oriented Workshop
- 1-day Pedestrian Facility Design Training
- 1-day Bicycle Facility Design Training
- 1-day Work Zone Design Manual Training
- 2-hour Roundabout Workshops
- 2-hour Pedestrian Crossing Workshops
- 2-hour Road Safety Audit (RSA) Workshops

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- One-day workshop for Intersection Design for Pedestrians and Bikes through Initiative for Bicycle and Pedestrian Innovation (IBPI)

## SELECTED PRESENTATIONS/WEBINARS

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*Construction of a 14.0-km Divided Highway Through a Mountain Pass in South Africa.* Institute of Transportation Engineers (ITE), Quad Conference. 2004.

*Efficiency of Dual Lefts Turning into Short Receiving Lanes – A Case Study.* Institute of Transportation Engineers (ITE). 2007. / Transportation Research Board (TRB), 2008.

*Pedestrian Crossings.* Transportation Education Series. 2010.

*Going Green by Flashing Yellow – Evaluation of Protected/Permissive Flashing Yellow Arrow Left-Turn Phasing.* Institute of Transportation Engineers (ITE). Western District Annual Meeting. 2011. / Transportation Education Series. 2012.

*Road Safety Audit, Mt. Hood Highway (Hwy. 26) (Mile Post 47.0 to 54.3).* Institute of Transportation Engineers (ITE), Western District Annual Meeting. 2011.

*NCHRP Report 707: Guidelines on the Use of Auxiliary Through Lanes at Signalized Intersections.* National Cooperative Highway Research Program (NCHRP), TRB, National Research Council. 2012.

*FHWA Road Safety Audit Process and Project Applications.* Transportation Education Series. 2011. / American Public Works Associations (APWA), Oregon Chapter. 2012.

*Washington County Bicycle Facility Design Toolkit.* Central Oregon Series on Transportation. 2017. 2013.

*Interchanges in an Urban Environment.* Transportation Education Series. 2013.

*OR 213: I-205 to Redland Road Crossing (Jughandle) Project.* TRB, Alternative Intersections & Interchange Symposium. 2014.

*Displaced Left Turn Intersection Informational Guide.* Federal Highway Administration (FHWA). 2014

*Integrating Design through 3D Technology.* Transportation Education Series. 2016.

*Talking Freight Seminar Series; Accommodating Trucks in Innovative Design Intersections and Interchanges.* FHWA. 2016

*Montana Department of Transportation (MDT) Road Design Manual (RDM) Update: Incorporating Performance-Based Design.* TRB International Access Management Conference. 2016. / Montana Joint Engineering Conference. 2016.

*TOPR 34: Accelerating Roundabout Implementation in the United States.* FHWA. 2017

*Performance-Based Design and Improving the Geometric Design Process.* TRB. 2017

*Impacts of Connected Vehicles/Autonomous Vehicles (CV/AV) on Multi-modal Geometric Design.* American Society of Landscape Architects. 2017.

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*Roundabout Constructability.* ASCE/SLOCOG Roundabout Seminar. 2017 / Central Oregon Series on Transportation. 2017

*Creating a 21<sup>st</sup> Century Design Standard Manual.* American Public Works Associations (APWA), Oregon Chapter. 2018.

*FHWA Information Alternative Intersections/Interchanges Guides,* Oregon Department of Transportation (ODOT) DOT/ American Council of Engineering Companies (ACEC). Technical Brown Bag Session. 2018/ Central Oregon Series on Transportation. 2018

*Intersection Control Evaluation.* American Public Works Associations (APWA), Oregon Chapter. 2018.

*Optimizing Lane Widths,* Institute of Transportation Engineers (ITE). 2018

*Transportation Design for Community Outcomes | Policymakers' Forum and Technical Workshop,* Portland Metro. 2019

*Road Safety Audits – Engineering Investigative Science.* American Public Works Associations (APWA), Oregon Chapter. 2019.

*Complete Streets Training Workshops.* Florida Department of Transportation. 2019.

*Speed Management Training Workshop.* Florida Department of Transportation. 2020.

*Roundabout Intersection improvement (Lake & Everett),* American Society of Civil Engineers (ASCE) Washington, 2021.

*Complete Street Design Update (focusing on protected intersections),* Washington County Oregon, 2021.