



# Program Progress Performance Report for University Transportation Centers

Prepared for the USDOT Research and Innovative Technology Administration (RITA)

Project title: **Pacific Northwest Transportation Consortium (PacTrans): Using Technological Advances to Develop Data-driven, Sustainable Solutions for the Diverse Transportation Needs of the Pacific Northwest**

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Report #3, PPPR reporting on third six months (January 1, 2013 – June 30, 2013)

## 1. Accomplishments

- **What are the major goals and objectives of the program?**

PacTrans focuses on using technological advances to develop data-driven, sustainable solutions for the diverse transportation needs of the Pacific Northwest. Major goals and objectives of PacTrans include: serving as Region 10's research engine, applied technology showcase, workforce development base, educational leader, information center, and collaboration platform.

- **What was accomplished under these goals?**

During the six month period (from Jan. 1 – June 30, 2013), the following was accomplished:

- PacTrans funded research, education, and outreach projects progressed well.
- The PacTrans Seminar Series, which launched in Fall 2012, held two seminars on the UW campus, which attracted many students, faculty, staff, and transportation professionals in the Pacific NW region who engage in transportation research and practice. The PacTrans Seminar talks were broadcast over the Internet in real time to provide remote audiences an opportunity to listen and ask questions. The two speakers were Carnegie Mellon University professor and Green Design Institute Co-Director Chris Hendrickson on February 27<sup>th</sup> and Region 9 UTC (at UC Berkeley) Director Robert Cervero on April 19<sup>th</sup>.
- Each consortium partner also hosted their own academic exchange events with PacTrans supports. The University of Washington, for example, invited eight recognized professionals from research institutes, industry, and transportation agencies to visit the UW campus and shared their research findings and success stories with faculty and students.
- PacTrans played an active role during the 2013 TRB Annual Meeting by hosting a Region 10 UTC reception, delivering 38 technical presentations (or posters), and actively supporting UTC related activities.
- The PacTrans Board of Directors identified critical regional transportation issues that merit further research. They also worked with public and private collaborators to develop new research statements for research in Year Two and beyond.
- A conference committee has been set up to plan the Region 10 Transportation Conference, scheduled to take place on the Seattle UW campus October 18<sup>th</sup>. The committee has already identified a keynote speaker for the event who has a long-standing reputation in safety and sustainability: Prof. Kumares Sinha, a member of the National Academy of Engineering, Purdue Univ.
- A student committee consisting of graduate students from the PacTrans consortium universities and Portland State University has been set up to plan the Region 10 Student Transportation Conference, scheduled to take place on the Seattle UW campus on October 19<sup>th</sup> 2013.

- The UI Clean Snowmobile Team has led numerous tours of their garage and laboratory facilities for many visitors that include K-12 student groups and Boeing researchers. The team also presented at the University of Idaho Engineering Expo in April, where they achieved an Excellence in Technical Presentation award.
- The UI Clean Snowmobile Team also competed in the SAE Clean Snowmobile Challenge in March 2013 in Houghton, Michigan. The team placed third overall, and received ten awards and trophies including Best Design, Best Value, Best Ride, Best Written Design Paper, and the BASF Innovation Award. The two student graduate mentors have accepted job offers with Arctic Cat and Polaris. The award-winning design paper was submitted to SAE for publication as a refereed technical paper. The team was awarded its second patent, for a bolt-in rear snowmobile drive system.
- PacTrans also contributed significantly to the success of the following academic events:
  - o 2013 National Student Steel Bridge Competition (hosted by UW students)
  - o AutoUI (PacTrans associate director Linda Boyle served as program chair)
  - o 2013 Bicycle Urbanism Symposium (organized by the UW's College of Built Environments)

- **What opportunities for training and professional development have the program provided?**

The vast majority of research projects involve graduate students, which also provide many opportunities to work with state and local transportation agencies. By involving students, PacTrans provide students an invaluable opportunity to develop skills they need to be successful in their future careers in academia, industry, and government. The intern program between PacTrans and WSDOT continued to offer great training opportunities for undergraduate students. PacTrans worked with regional industry (e.g. Transpo) and transportation agency partners (e.g. Seattle DOT) to initiate many new intern positions for graduate students. Additionally, starting this summer, PacTrans initiated a new internship program for promising young high school students. The driving force behind this program is to introduce young people to transportation engineering before university by getting them involved in research projects.

- **How have the results been disseminated? If so, in what way/s?**

As of this writing, several outcomes of Region 10 UTC funded research projects have been showcased in invited talks, conference presentations, and archival publications. PacTrans promotes research outcomes through social media, such as the PacTrans website and Twitter. PacTrans has a strong outreach program to local and state transportation agencies and private partners in the region, through which PacTrans research outcomes are presented and demonstrated. Worth mentioning is the May 8, 2013 selection of UW Associate Professor Steve Muench's Greenroads Team rating system (which assesses the sustainability of new, reconstructed, and rehabilitated roads and was previously funded by the Region 10 UTC) as a White House Champion of Change. Associate Professor Muench's work makes a strong contribution to the body of Region 10 transportation research. In May 2013, PacTrans was invited to present Digital Roadway Interactive Visualization and Evaluation Network (DRIVE Net) data processing applications at the USDOT Transportation Data Palooza. (Additional details on dissemination of research results are provided in Section 2 "Products.")

- **What do you plan to do during the next reporting period to accomplish the goals and objectives?**

- PacTrans will continue to follow its implementation plan to ensure that all PacTrans funded research, education, and outreach activities move forward as scheduled.
- The PacTrans Region 10 Transportation Conference and Student Conference to be held in October 2013 will be a very important opportunity for PacTrans researchers to share research accomplishments, showcase new technologies, and form up new collaborations.
- We are currently planning several public talks as part of the PacTrans seminar series for Fall 2013 and Winter 2014. As with all PacTrans seminars, the talks will be open to the PacTrans university community as well as the entire Pacific NW transportation community. For those who cannot attend in person, we will continue to make the talk available as a webinar through GoTo Meeting.
- We will continue to enhance the PacTrans website to include additional information about our projects and research findings, and future research opportunities.

## 2. **Products (for the reporting period of January 1 – June 30, 2013)**

Products (for the reporting period of Jan. 1, 2013 – June 30, 2013)						
	PacTrans Total	UW	WSU	UI	OSU	UAF
Publications: peer reviewed journal articles	56	43	6	0	7	0
Publications: Book chapters and other edited manuscripts	2	2	0	0	0	0
Conference papers	13	10	1	0	2	0
Conference presentations	56	40	13	2	1	0
Lectures/Seminars /Workshops/ Invited Talks	24	20	2	0	2	0
Inventions, patent applications, and/or licenses	3	2	0	1	0	0
Other products: data or databases, physical collections, audio or video products, software or NetWare, models, educational aids or curricula, instruments, or equipment	2	1	1	0	0	0

**Peer reviewed journal articles (PacTrans members are in bold)**

1. Alexander, D., J. C. Linnes, S. Bolton, and T. Larson. Evaluating the association between improved stove implementation and respiratory health-related quality of life in a small intervention study in Bolivia. *Journal of Epidemiology and Community Health*. 2013. In press.
2. Ballinger M., R. Woodruff, C. Duchsherer, T. V. Larson. Estimating Air Chemical Emissions from Research Activities Using Stack Measurement Data. *Journal of the Air and Waste Management Association* 63(3), 336-348, 2013.
3. Berman, J.W. and M. Bruneau. Overview of the Development of Design Recommendation for Eccentrically Braced Frame Links with Built-Up Box Sections. *Engineering Journal*, Vol. 50, No. 1, pp. 21-32, 2013.
4. Bhusal, S. and H. Wen. Evaluate Recycled Concrete Aggregate as Hot Mix Asphalt Aggregate. *ASTM Journal of Advances in Civil Engineering Materials*, 2013. Accepted.
5. Cao, J., X. Liu, **Y. Wang**, and Q. Li. Accessibility Impacts of China's High-Speed Rail Network. *Journal of Transport Geography*. Vol. 28, 12-21, 2013.
6. Chen, C., D. Neal, and M. Zhou. Understanding the Evolution of a Disaster—A Framework for Assessing Crisis in a System Environment (FACSE). *Natural hazards* 65(1), 407-422, 2013.
7. Davis, Phillip M., T. M. Janes, J. F. Stanton, M. O. Eberhard, and O.S. Haraldsson. Unbonded Pre-tensioned Columns for Accelerated Bridge Construction in Seismic Regions. Submitted to *Journal of Bridge Engineering, ASCE*, 2013.
8. Drewnowski, A., **A. V. Moudon**, J. Jiao, A. Aggarwal, H. Charreire, B. Chaix. Food shopping behaviors and socioeconomic status influence obesity rates in Seattle and in Paris. *Int J Obesity*. In press.
9. Ewing, R., L. Chen, and C. Chen. Quasi-experimental study of Traffic Calming Measures in New York City. *Transportation Research Record*. In press.
10. Ghazizadeh, M., **L. N. Boyle**. Crash injuries in four Midwestern states: Comparisons to regional estimates. *Journal of Transportation and Statistics*. Accepted.
11. Haraldsson, O.S., T.M. Janes, M.O. Eberhard, and J.F. Stanton. Seismic Resistance of Socket Connection between Footing and Precast Column. *Journal of Bridge Engineering, ASCE*, September 2013.
12. Hong, J. H., Q. Shen, and L. Zhang. How Do Built-Environment Factors Affect Travel Behavior? A Spatial Analysis at Different Geographic Scales. *Transportation*, Vol. X, No. X, pp. X-X. Accepted.
13. Hong, J. H. and Q. Shen. Residential Density and Transportation Emissions: Examining the Connection by Addressing Spatial Autocorrelation and Self-selection. *Transportation Research*, Part D, Vol. X, No. X, pp. X-X. Accepted.
14. Hou, L., Y. Lao, **Y. Wang**, Z. Zhang, Y. Zhang, and Z. Li. Modeling Freeway Incident Response Time: a Mechanism-based Approach. *Transportation Research Part C*. Vol. 28, 87-100, 2013.
15. Liu, X., H. Wen, T. Edil, T.M. VanReken, and R. Sun. Cost, Energy, and Greenhouse Gasses Analysis of Asphalt Pavement with Cementitious High Carbon Fly Ash Stabilized Cold In-Place Recycled Asphalt Pavement as Base Course. *International Journal of Road Materials and Pavement Design*, 2013.
16. Liu, X., G. Zhang, C. Kwan, **Y. Wang**, and B. Kemper. Simulation-Based Scenario-Driven Integrated Corridor Management Strategy Analysis. *Transportation Research Record*, 2013. In Press.
17. Kang, B., **A. V. Moudon**, P. M. Hurvitz, L. Reichley, B. E. Saelens. Walking objectively measured: Classifying accelerometer data with GPS and travel diaries. *Med Sci Sports Exerc*. pp. 1530-0315, 2013.
18. Kernic, M. A., F. P. Rivara, D. F. Zatzick, M. J. Bell, M. S. Wainwright, J. I. Groner, C. C. Giza, R. B. Minkk, R. G. Ellenbogen, **L. N. Boyle**, P. H. Mitchell, N. Kannan, M. Vavilala. Triage of children with moderate and severe traumatic brain injury in trauma centers. *Journal of Neurotrauma*. Accepted.

19. Khaleghi, B., Schultz, E., Seguirant, Steve, M.L Marsh,, O.S. Haraldsson, Eberhard, M.O. and Stanton, J.F. Accelerated Bridge Construction in Washington State -- From Research to Practice, reprint of 2012 publication, to appear in *Concrete Journal, Japanese Concrete Institute*, 2013. In Japanese.
20. Khachatryan, H., J. Joireman and K. Casavant. Relating Values and Consideration of Future and Immediate Consequences to Consumer Preference for Biofuels: A Three-Dimensional Social Dilemma Analysis. *Journal of Environmental Psychology* 34 (June 2013) 97-108, 2013.
21. Kim, K.S., D. Fratta, and H. Wen. Field Measurements for the Effectiveness of Compaction of Coarse-grained Soils. Accepted for publication by *KSCE Journal of Civil Engineering*, 2013.
22. Malakoutian, M., J. W. Berman, and P. Dusicka. The Linked Column Framing System: Analysis and Design Recommendations. *Earthquake Engineering and Structural Dynamics*, Vol. 42, No. 6, pp. 795-814, 2013.
23. Meskele, T. and A. W. Stuedlein. Analysis of a 610-mm Diameter Pipe Installed Using Pipe Ramming. *Journal of Performance of Constructed Facilities*, ASCE, Vol. TBD, No. TBD, pp. TBD. In press.
24. Meskele, T., and A. W. Stuedlein. Hammer-Pipe Energy Transfer Efficiency for Pipe Ramming. *No-Dig 2013, North American Society for Trenchless Technology*, Sacramento, CA. 10, 2013.
25. **Moudon, A. V.**, A. Drewnowski, G.E. Duncan, P. M. Hurvitz, B. E. Saelens, and E. Scharnhorst. Characterizing the food environment: pitfalls and future directions. *Public Health Nutrition*. In press.
26. O'Connor, S.S., J. M. Whitehill, K. M. King, M. Kernic, **L. N. Boyle**, B. Bresnahan, C. D. Mack, and B. E. Ebel. Compulsive cell phone use and history of motor vehicle crash. Accepted by the *Journal of Adolescent Health*.
27. Olsen, M.J. In-Situ change analysis and monitoring through terrestrial laser scanning. *ASCE Journal of Computing in Civil Engineering*. In press.
28. Olsen, M.J., E. Johnstone, and F. Kuester. Hinged, pseudo-grid triangulation method for long, near linear cliff analysis. *ASCE Journal of Surveying Engineering*, 139(2), 105-109, 2013.
29. Ottosson, D., C. Chen, T. Wang, and H. Lin. The sensitivity of on-street parking demand in response to price changes: a case study in Seattle, WA. *Transport Policy* 25, 222-232, 2013.
30. Pan, H. X., Q. Shen, and T. Zhao. Travel and Car Ownership of Residents near New Suburban Metro Stations in Shanghai. Accepted for publication by the *Transportation Research Record*, No. X, pp. X-X.
31. Peng, Y., **L. N. Boyle**, S. Hallmark. Driver's lane keeping ability while distracted: insights from a naturalistic study. *Accident Analysis and Prevention*, 50, 628-634, 2013.
32. Perry, C. K., G. R. Herting, E. M. Berke, H. Q. Nguyen, **A. V. Moudon**, S. A. Beresford, J. K. Ockene, J. E. Manson, and A. Z. LaCroix. (2013). Does neighborhood walkability moderate the effects of intrapersonal characteristics on amount of walking in post-menopausal women? *Health & Place* 21 pp. 39-45, 2013.
33. Pitera, K., **L. N. Boyle**, and A. Goodchild. Economic analysis of onboard monitoring systems in commercial vehicles. Accepted for publication by the *Transportation Research Record*.
34. Pitera, K., **L. N. Boyle**, A. Goodchild. Process comparison of hours of service recording for commercial vehicle operations: Electronic versus paper. *ASCE Journal of Transportation Engineering*, 139(3), 266-272, 2013.
35. Reddy, S.C. and A. W. Stuedlein. Accuracy and Reliability-based Region-Specific Recalibration of Dynamic Pile Formulas. *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards*, Vol. TBD, No. TBD, pp. TBD. In press.
36. Sampson, P. D., M. Richards, A. A. Szpiro, S. Bergen, L. Sheppard, T. V. Larson, and J. D. Kaufman. A Regionalized National Universal Kriging Model using Partial Least Squares Regression for Estimating Annual PM2.5 Concentrations in Epidemiology. *Atmospheric Environment*, 2013. In press.
37. Sun, M., J. D. Kaufman, S-Y. Kim, T. Larson, T. Gould, J. F. Polak, M. J. Budoff, A. V. Diez Roux, and S. Vedal. Commonly-used Approaches to Estimating Long-term Exposure to Fine Particulate Matter

- (PM2.5). *Components and Prevalence of Subclinical Atherosclerosis in the Multi-Ethnic Study of Atherosclerosis Environmental Health*, 2013. In press.
38. Shen, Q. Transportation Planning. *International Encyclopedia of the Social and Behavioral Sciences*. Second Edition, Oxford, UK: Elsevier, pp. X-X. In press.
  39. Strahler, A.W. and A. W. Stuedlein. Characterization of Model Uncertainty in Immediate Settlement Calculations for Spread Footings on Clay. *Proceedings, 18th Int. Conf. Soil Mech. and Geotech. Engrg.*, Paris 2013.
  40. Tang, J., **Y. Wang**, and F. Liu. Characterizing Traffic Time Series Based on Complex Network Theory. *Physica A*, 2013. In Press.
  41. Thamsuwan O., R. P. Blood, R. P. Ching, **L. N. Boyle**, P. W. Johnson. Whole body vibration exposures in bus drivers: A comparison between a high-floor coach and a low-floor city bus. *International Journal of Industrial Ergonomics*, 43, 9-17. (IF: 1.260), 2013.
  42. Vedal, S., J. D. Kaufman, T. V. Larson, P. D. Sampson, E. A. Sheppard, C. D. Simpson, A. A. Szpiro, J. D. McDonald, A. K. Lund, M. J. Campen, S. Bergen, C. CurlSun-Young Kim, K. Miller, J. R. Fox, S. Adar, and J. L. Mauderly. University of Washington/Lovelace Respiratory Research Institute National Particle Component Toxicity (NPACT) Initiative: Integrated Epidemiological and Toxicological Cardiovascular Studies to Identify Toxic Components and Sources of Fine Particulate Matter. *Res Rep Health Eff Inst.*, 2013.
  43. Wang, Z., J. Sage, J., A. Goodchild, E. Jessup, **K. Casavant**, R. Knudson. A Framework for Determining Highway Truck-Freight Benefits and Economic Impacts. Accepted for publication by the *Transportation Research Forum*.
  44. Wang, T. and C. Chen. Impact of fuel price on vehicle miles traveled (VMT): does the poor respond in the same way as the rich? Accepted for publication in *Transportation*.
  45. Wang, H., W. Quan, **Y. Wang**, and X. Liu. Safety Distance Modeling on the Basis of Vehicle-to-Vehicle Communication. *Transportation Research Record*. In Press.
  46. **Wang, Y.**, X. Ma, Y. Lao, and H. Mao. Vehicle Routing Problem: Simultaneous Deliveries and Pickups with Split Loads and Time Windows. *Transportation Research Record*. In Press.
  47. Wen H., M. Wu, and J. Wang. Development of Rutting Model for Unbound Aggregates Containing Recycled Asphalt Pavement. *ASTM Geotechnical Testing Journal*, Volume 36, Issue 2, 2013.
  48. Wen, H. and S. Bhusal. Towards Development of a New Thermal Cracking Test Using the Dynamic Shear Rheometer. *ASTM Journal of Testing and Evaluation*, Volume 41, Issue 3, 2013.
  49. Williams, K., M. J. Olsen, G. V. Roe, and C. Glennie. Review: Transportation Applications of Mobile LIDAR. Accepted for publication in *Remote Sensing, Special Issue on Advances in Mobile Laser Scanning and Mobile Mapping*.
  50. Yin, G., A. Lawal, J. Ricks, J. R. Fox, T. Larson, M. Navab, A. M. Fogelman, M. E. Rosenfeld, and J. A. Araujo. Diesel Exhaust Induces Systemic Lipid Peroxidation and Development of Dysfunctional Pro-oxidant and Pro-inflammatory HDL. *Arteriosclerosis, Thrombosis, and Vascular Biology*. In press.
  51. Yu, R., Y. Lao, X. Ma, and **Y. Wang**. Short-Term Traffic Flow Forecasting for Improved Estimates of Freeway Incident Induced Delays. *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*, 2013. In Press.
  52. Zhang, G., and **Y. Wang**. Gaussian Kernel Based Approach for Modeling Vehicle Headway Distributions. *Transportation Science*. In Press.
  53. Zhang, G. and **Y. Wang**. Optimizing Coordinated Ramp Metering – A Preemptive Hierarchical Control Approach. *Computer-Aided Civil and Infrastructure Engineering*. Vol. 28, 23-27, 2013.



54. Zhao, W., and A. Goodchild. Using a Truck Appointment System to Improve the System Efficiency of Container Terminals. *Journal of Maritime Economics and Logistics* 15, 101–119, 2013.
55. Zhao, W., E. McCormack, D. Dailey, and E. Scharnhorst. Using Truck Probe GPS Data to Identify and Rank Roadway Bottlenecks. *ASCE Journal of Transportation Engineering*, 139(1), 1–7, 2013.
56. Zheng, J., Y-J. Wu, X. Ma, **Y. Wang**. Measuring Signalized Intersection Performances in Real-Time with Traffic Sensors. *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*, 2013. In Press.

**Book chapters and other edited manuscripts (PacTrans members are in bold)**

1. Manser, M., J. Creaser and **L. N. Boyle**. Behavioral adaptation methodological and measurement issues. Rudin-Brown, M. and Jamson S. (Eds.), *Behavioral Adaptation and Road safety: Theory, Evidence and Action*, CRC Press, pp. 339-358, 2013.
2. **Moudon, A. V.** Built environment: Exposure, Access, and Use. *Urban Dynamics and Nature: Planning and Designing with Nature in the City*. National Technical University of Athens. In press.

**Conference papers (PacTrans members are in bold)**

1. Browne, M. and A. Goodchild. Modeling Approaches to Address Urban Freight's Challenges: A Comparison of the US and Europe. *City Logistics Research: A Trans-Atlantic Perspective*, Washington, D.C., May 2013.
2. Ghazizadeh, M., Y. Peng, J.D. Lee, and **L. N. Boyle**. Assessing text reading and text entry while driving using the visual occlusion technique. *Proceedings of the 7th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design*, Lake George, NY. Forthcoming, 2013.
3. Ghazizadeh, M., V. Venkatraman, J.D. Lee, **L. N. Boyle**. Text readability and drivers' reading time: Insights from a visual occlusion study. *Proceedings of the Human Factors and Ergonomics Society 57th Annual Meeting*, San Diego, CA. Forthcoming, 2013.
4. Haselbach, L., C. Poor, and J. Tilson. Removal of High Levels of Dissolved Zinc and Copper in Pervious Concrete, *Proceedings NRMCA*, San Francisco, CA, May 2013.
5. Hurwitz, D.S., H. Tuss, M.J. Olsen, G.V. Roe, and M.A. Knodler. Transportation applications for Mobile LIDAR scanning: A state-of-the-practice questionnaire. *Transportation Research Record Annual Meeting*, CD-ROM, 2013.
6. Ma, X., S. Xiao, and **Y. Wang**. E-Science Infrastructure for Data-Driven Computing over Transportation Networks. Submitted to the *9th IEEE International Conference on e-Science*, May 2013.
7. Miller, E., **L. N. Boyle**. Does direction of travel impact driver stress: Insights from an on-road study. *Proceedings of the Human Factors and Ergonomics Society 57th Annual Meeting*, San Diego, CA. Forthcoming, 2013.
8. Peng, Y., M. Ghazizadeh, **L. N. Boyle**, J. D. Lee. Factors affecting glance behavior when interacting with in-vehicle devices: Implications from a simulator study. *Proceedings of the 7th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design*, Lake George, NY. Forthcoming, 2013.
9. Reis, B., **L. N. Boyle**, et al. Assessing clinical care using interactive value stream mapping. *Proceedings of the Human Factors and Ergonomics Society 57<sup>th</sup> Annual Meeting*, San Diego, CA. Forthcoming, 2013.
10. Sharifi-Mood, M., R. Santha-Mahalingam, and M.J. Olsen. Geospatial characterization of causative factors for landslides in the Oregon Coast Range. *ASCE GeoCongress 2013*, San Diego, CA. CD-ROM, 2013.



11. Tang, J., **Y. Wang**, H. Wang, and F. Liu. Complex Network Approach for the Complexity and Periodicity in Traffic Time Series. *Proceedings of the 13th COTA International Conference of Transportation Professionals (CICTP 2013)*. August 2013.
12. Xiong, H. and **L. N. Boyle**. Drivers' selected settings for adaptive cruise control (ACC): Implications for long-term use. *Proceedings of the Human Factors and Ergonomics Society 57th Annual Meeting*, San Diego, CA. Forthcoming, 2013.
13. Zhao, J. H., Z. Zhao, and Q. Shen. Has Shanghai's Transportation Demand Passed Its Peak Growth? CD-ROM of the *Annual Conference of Transportation Research Board*, 2013.

**Conference presentations (PacTrans members are in bold)**

1. Alam, A., L. Haselbach, G. DeRooy, C. Poor, and M. Wolcott. Green Rating Integration Platform – A Decision Making Tool for Multi-Modal Facilities: Sustainable Water & Material Practices, Presentation at the Transportation Research Board Annual Meeting, Washington, D.C., Jan. 2013.
2. Berman, J.W. Recent Advances in Steel Plate Shear Walls. North American Steel Construction Conference, St. Louis, MO, April 2013.
3. **Casavant**, K. B. Ivanov, D. Moore, J. Sage, and J. Taylor. The Economic Impact of Increased Congestion for Freight Dependent Businesses. Presented at Western Economic Association International 88th Annual Conference in Seattle, WA, June 28-July 2, 2013.
4. Chen, P., P. Schmiedeskamp, S. Childress, Q. Shen, and A. Bassok. A GPS Data Based Analysis of Built Environment Influences on Bicyclist Route Preferences. Paper presented at Bicycle Urbanism Conference, Seattle, June 21, 2013.
5. Corey, Jonathan, Y. Lao, and **Y. Wang**. Quantifying and Comparing Left-Turn Strategy Performance. Presented by Jonathan Corey at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
6. Dunham, L., J. Wartman, M. Olsen, and A. Metzger. A Platform for Proactive Risk-based Slope Asset Management. Presented at the 56th annual meeting of the Association of Environmental and Engineering Geologists, 2013.
7. Goodchild, A. and E. Wygonik. Opportunities for Freight Efficiency and Logistics to Meet Energy and Environmental Goals in the Freight Sector. Assessing the Future of Freight: Energy and Environmental Modeling in the Freight Sector Workshop at the Annual Meeting of the Transportation Research Board, Washington, D.C., Jan. 2013.
8. Grislis, Aivis, Y. Lao, Yao-Jan Wu, and **Y. Wang**. Parameters Influencing Single-Vehicle Large-Truck Accidents on Rural Two-Lane Roads in Washington State. Presented by Yinhai Wang at the 92nd Annual Meeting of Transportation Research Board, Jan. 2013.
9. Haque, M., A.D. Ohlhauser, S. Washington, and **L. N. Boyle**. Examination of distracted driving and yellow light running: analysis of simulator data. Transportation Research Board 92st Annual Meeting, Washington, DC, Jan 2013.
10. Haraldsson, O. Precast Concrete Bridge Columns Made with Unbonded Pre-Tensioning and Hybrid Fiber Reinforced Concrete for Improved Seismic Resistance. 3/13 10th International Conference on Urban Earthquake Engineering, 2013.
11. Holmgren, M., **K. Casavant**, E. Jessup and J. Sage. After 35 Years, Does It Need to Change? Evaluating the Fuel Usage Factor for Structures. Presented at the Transportation Research Board 92nd Annual Meeting in Washington, D.C., Jan. 13-17, 2013.

12. Hsiao, P.C., D.E. Lehman, J.W. Berman, C.W. Roeder, and J. Powell. Seismic Performance of Older Steel Braced Frames. ASCE/SEI Structures Congress, Pittsburgh, PA, May 2013.
13. Lao, Yunteng, G. Zhang, and **Y. Wang**. Generalized Nonlinear Models for Rear-End Crash Risk Analysis. Presented by Yunteng Lao at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
14. Liu, Xiaoyue, **Y. Wang**, B. Schroeder, and N. Rouphail. Analysis of Managed Lanes on Freeway Facilities. Presented by Yin Hai Wang at the TRB Mid-Year Meeting of the Freeway Operations, Active Traffic Management, and Managed Lane Committees, Atlanta, Georgia. June 23-26, 2013.
15. Liu, Xiaoyue, G. Zhang, C. Kwan, **Y. Wang**, and B. Kemper. Simulation-Based Scenario-Driven Integrated Corridor Management Strategy Analysis. Presented by Xiaoyue Liu at the 92nd Annual Meeting of Transportation Research Board, Jan. 2013.
16. Liu, Xiaoyue, G. Zhang, and **Y. Wang**. Twin Cell Modeling Approach for Parallel Freeway Facilities: Managed-Lane Example. Presented by Xiaoyue Liu at the 92nd Annual Meeting of Transportation Research Board, Jan. 2013.
17. Lowry, M., S. McDaniel, and M. Dixon. New GIS Tools to Estimate Bicycle Volumes Based on Street Connectivity. Presented at the International Bicycle Urbanism Symposium, Seattle, Washington, June 21, 2013.
18. Ma, Xiaolei, S. Xiao, J. Corey, and **Y. Wang**. Digital Roadway Interactive Visualization and Evaluation Network – DRIVE Net. Presented by Jonathan Corey and Xiaolei Ma at the USDOT Data Palooza. May 18-19, 2013.
19. Ma, Xiaolei, Yao-Jan Wu, **Y. Wang**, F. Chen, and J. Liu. Mining Smart Card Data for Transit Riders' Travel Patterns. Presented by Xiaolei Ma at the 92nd Annual Meeting of Transportation Research Board, Jan. 2013.
20. Ma, Xiaolei, **Y. Wang**, F. Chen, and J. Liu. Transit Smart Card Data Mining for Passenger Origin Information Extraction. Presented by Xiaolei Ma at the 92nd Annual Meeting of Transportation Research Board, Jan. 2013.
21. Malakoutian M., J.W. Berman, P. Dusicka, and A. Lopes. Seismic Design Parameters for the Linked Column Frame System. ASCE/SEI Structures Congress, Pittsburgh, PA, May 2013.
22. Malinovskiy, Yegor, B. Namaki, T. Bailey, R. Vessey, and **Y. Wang**. Error Assessment for Emerging Traffic Data Collection Devices. Presented by Yegor Malinovskiy at the 2013 Western States Rural Transportation Technology Implementers Forum, Yreka, CA, June 18-20, 2013.
23. Malinovskiy, Yegor and **Y. Wang**. Interpreting Opportunistic Mobile Device Encounter Data for Transportation." Presented by Yegor Malinovskiy at the 16th COTA Annual Symposium Sustainable Transportation and Development in China, Jan. 2013.
24. McMullen, B. Starr, D. Holder, Z. Wang, E. McCormack, A. Goodchild, **K. Casavant** and J. Sage. The Measurement and Valuation of Time and time Reliability for Freight for Use in Highway Project Evaluation: Conceptual and Practical Issues. Presented at Transportation Research Forum 54th Annual Meeting in Annapolis, MD, March 21-23, 2013.
25. Mjelde D., H. Wen, and D. McLean. Use of Recycled Concrete as Aggregates for Portland Cement Concrete Pavements. Paper presented at 2013 ASCE Airfield and Highway Pavement, Los Angeles, CA, May 2013.
26. Pan, H., Q. Shen, and T. Zhao. Travel and Car Ownership of Residents near New Suburban Metro Stations in Shanghai. Paper presented at the 92nd Annual Meeting of Transportation Research Board, Washington, DC. Jan. 15, 2013.

27. Pitera, K., **L. N. Boyle**, and A. Goodchild. Economic analysis of onboard monitoring systems in commercial vehicles. Transportation Research Board 92st Annual Meeting, Washington, D.C., Jan 2013.
28. Pospisil, M., G.W. Warn, and J.W. Berman. Design Lateral Force Distribution for Steel Plate Shear Walls Based on Plastic Behavior. ASCE/SEI Structures Congress, Pittsburgh, PA, May 2013.
29. Rowell, Gagliano and A. Goodchild. Understanding Truck Route Choice: Implications for Travel Models. Annual Meeting of the Transportation Research Board, Washington D.C., Jan. 2013.
30. Sage, J. and **K. Casavant**. "Choosing the Right Model: Effects of the Economic Impact Model Selection on Truck-Freight Network Investment Prioritization." Presented at Western Economic Association International 88th Annual Conference in Seattle, WA, June 28-July 2, 2013.
31. Sage, J. "Keeping Freight Moving: Enabling Disaster Resilient Transportation Networks." Presented at Transportation Research Board's midyear meeting, Meeting State & MPO Information Needs in a Constrained Fiscal Environment, in Washington D.C., June 10-12, 2013.
32. Sage, J., **K. Casavant**, and C. Lawson. "Time for Change? Evaluating the Jurisdictional and Industry Benefits of a Full Reciprocity System in Commercial Vehicle Registration." Presented at the Pacific Northwest Regional Economic Conference 2013 in Spokane, WA, May 16-17, 2013.
33. Sage, J., **K. Casavant**, J. Eustice and Y. Zhou. "Washington State Commodity Flows: Improving the Understanding of the Impacts of Infrastructure Investment." Presented at the Pacific Northwest Regional Economic Conference 2013 in Spokane, WA, May 16-17, 2013.
34. Sage, J., V. McCracken and R. Sage. "Bridging the Gap: Do Farmers' Markets Help Alleviate Impacts of Food Deserts?" Presented at the AEA Allied Social Science Associations 2013 Convention in San Diego, CA. January 4-6, 2013.
35. Shen, Q., P. Chen, and H. Pan. Joint Effects of Residential Relocation and Rail Transit Development on Commuting Mode Choice. Paper presented at the 7th International Association for China Planning (IACP) Conference, Shanghai, China, June 30, 2013.
36. Simmons, S, **K. Casavant** and J. Sage. "A Real Time Assessment of the Columbia-Snake River Extended Lock Outage: Process and Impacts." Presented at the Transportation Research Board 92nd Annual Meeting in Washington, D.C., January 13-17, 2013.
37. Stanton, J.F. A Constructible Bridge Bent Designed to Recenter after an Earthquake. Western Bridge Engineers Seminar Bellevue, WA, Sept. 2013.
38. Stanton, J.F. Socket Connections for Rapid Construction of Bridge Bents with Spread Footings. Western Bridge Engineers Seminar Bellevue, WA, Sept. 2013.
39. Tang, Jinjun, **Y. Wang**, H. Wang, and F. Liu. Complex Network Approach for the Complexity and Periodicity in Traffic Time Series. To be presented by Jinjun Tang at the 13th COTA International Conference of Transportation Professionals (CICTP 2013). August 2013.
40. Taylor, J., **K. Casavant**, D. Moore, J. Sage and B. Ivanov. Freight Dependent Business Responses to Increased Costs of Congestion. Presented at Transportation Research Forum 54th Annual Meeting, in Annapolis, MD, March 21-21, 2013.
41. Taylor, J., **K. Casavant**, J. Sage. and B. Ivanov. The Cost of Congestion: Breaking Down Societal Benefits and Consumer Costs. Presented at the Pacific Northwest Regional Economic Conference 2013 in Spokane, WA, May 16-17, 2013
42. Thompson, M., L. Haselbach, C. Poor and M. Wolcott. Integrating Green Rating Systems: A Case Study for Ferry Terminals, J. of Green Building 8(1), 2013.
43. Wang, B.S., J.W Berman, C.W. Roeder, and D.E. Lehman. Estimation of the Maximum Von Mises Stress in the Steel Truss Bridge Gusset Plate Connections Proceedings of the 30th International Bridge Conference, Pittsburgh, PA, June 2013.

44. Wang, B.S., J.W Berman, S. Jost, C.W. Roeder, and D.E. Lehman. Re-Evaluating the Effect of Connection Length in Riveted Steel Connections” Proceedings of the 30<sup>th</sup> International Bridge Conference, Pittsburgh, PA, June 2013.
45. Wang, Hua, W. Quan, **Y. Wang**, and X. Liu. Safety Distance Modeling on the Basis of Vehicle-to-Vehicle Communication. Presented by Hua Wang at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
46. Wang, X. G., C. Liu, L. Kostyniuk, Q. Shen, and S. Bao. The Influence of Street Environments on Fuel Efficiency: Insights from Naturalistic Driving. Paper presented at the 7th International Association for China Planning (IACP) Conference, Shanghai, China, June 30, 2013.
47. Wang, Yong, X. Ma, Y. Lao, **Y. Wang**, and H. Mao. Location Optimization of Multiple Distribution Centers Based on Fuzzy Clustering Algorithm. Presented by Xiaolei Ma at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
48. Wang, Yong, X. Ma, Y. Lao, **Y. Wang**, and H. Mao. Vehicle Routing Problem: Simultaneous Deliveries and Pickups with Split Loads and Time Windows. Presented by Xiaolei Ma at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
49. Wang, Z, J. Sage, A. Goodchild, E. Jessup, **K. Casavant** and R. Knutson. A Framework for Determining Highway Truck-Freight Benefits and Economic Impacts. Presented at the Transportation Research Board 92nd Annual Meeting in Washington, D.C., Jan. 13-17, 2013.
50. Webster D.J., J.W. Berman, and L. N. Lowes. Alternative SPSW Web Plate Model Through Analytical and Experimental Investigations. ASCE/SEI Structures Congress, Pittsburgh, PA, May, 2013.
51. Weigand, J.M., T. Francisco, E.S. Johnson, L.A. Fahnestock, J. Liu, and J.W. Berman. Large-Scale Experimental Evaluation of Steel Gravity Framing Structural Integrity. ASCE/SEI Structures Congress, Pittsburgh, PA, May 2013.
52. Wu, Y. and **L. N. Boyle**. Adaptive Cruise Control: Driver characteristics that influence frequency of use. Transportation Research Board 92st Annual Meeting, Washington, D.C., Jan 2013.
53. Xiao, Sa, R. Yu, and **Y. Wang**. Modeling Framework for Long Distance Pleasure Travel Supply Analysis. Presented by Sa Xiao at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
54. Yu, Runze, X. Liu, and **Y. Wang**. Coherent Approach for Modeling and Nowcasting Hourly Near-Road Black Carbon Concentrations in Seattle, Washington. Presented by Xiaoyue Liu at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
55. Zhang, Guohui and **Y. Wang**. Innovative Coordinated Ramp Metering Control Strategy for Freeway Congestion Mitigation. Presented by Guohui Zhang at the 92nd Annual Meeting of Transportation Research Board, Washington D.C., Jan. 2013.
56. Zhao, Z., J. Zhao, and Q. Shen. 2013. Has Shanghai’s Transportation Demand Passed Its Peak Growth? Paper presented at the 92nd Annual Meeting of Transportation Research Board, Washington, D.C., Jan. 17, 2013.

***Invited Lectures (PacTrans members are in bold)***

1. **Boyle, L. N.** University of Nebraska–Lincoln, Workshop How do you turn this driving simulator on? Tutorial for traffic engineering & road design research using driving simulation. Apr 5, 2013.
2. **Boyle, L. N.** Transportation Research Board Workshop, How do you turn this driving simulator on? Tutorial for traffic engineering & road design research using driving simulation. Jan 13, 2013.

3. Goodchild, A. State-of-the-Practice in Urban Freight Transport Research, City Logistics Research: A Trans-Atlantic Perspective, EU-U.S. Transportation Research Symposium No. 1, May 2013.
4. Goodchild, A. Using Surveys to Enhance Freight Models: Lessons Learned, Freight Surveys Presentation given by Andrea Gagliano. Subcommittee Meeting, Annual Meeting of the Transportation Research Board, Jan. 2013.
5. **Moudon, A.** Urban Land Institute, Neighborhood Density Panel Moderator, Seattle, WA January 23, 2013.
6. **Moudon, A.** Active Living Research, Annual Conference, Invited speaker "Active Living Research 101," San Diego, Feb. 2013.
7. **Moudon, A.** Istanbul Technical University, Department of City and Regional Planning, two invited lectures on "Urban Morphology" and "The US City in History", Istanbul, Turkey, March 2013.
8. **Moudon, A.** University of Washington, ARCH 500, Studio on open space in Tacoma, WA. Presentation on street design, Seattle, WA, April 2013.
9. **Moudon, A.** University of Washington, GH 500, Global Health Seminar series, invited lecture "Globalization and Urbanization," Seattle, WA, April 2013.
10. **Moudon, A.** Universidade Técnica de Lisboa, Faculdade de Arquitectura, Invited lecture « Land colonization and urban form in North America," Lisbon, Portugal, May 2013.
11. McCormack, E. D. Applications of Truck GPS Data Truck. Freight Data Users Forum, Transportation Research Board Annual Conference, Washington D.C., Jan. 16, 2013.
12. **Wang, Y.** Transportation Research and Analysis Computing Center (TRACC) at Argonne National Laboratory. "Developing an Online Tool for Data-Driven Solutions to Transportation Problems." July 22, 2013.
13. **Wang, Y.** The 1st Shenzhen International Low-Carbon City Conference and the 4th Low-Carbon City Development World Forum. "E-Science Transportation Infrastructure for Big Data, Big Discovery, and Big Decisions." June 18, 2013.
14. **Wang, Y.** Southeast University Career Development Workshop. "Tips for Identifying Your Successful Career Path." Mar. 29, 2013.
15. **Wang, Y.** Zhejiang University of Technology. "Recent Research Advances at the STAR Lab." Mar. 25, 2013.
16. **Wang, Y.** Stanford University Sustainable Transportation Seminar. "DRIVE Net: An E-Science Transportation Platform for Big Data, Big Discovery, and Big Decision." Mar. 8, 2013.
17. **Wang, Y..** Session jointly organized by TRB AHB40 and AHB35 at the Annual Meeting of Transportation Research Board. "Twin Cell Modeling Approach for Parallel Freeway Facilities – A Managed Lane Example." Jan. 15, 2013.
18. **Wang, Y.** Freeway Simulation Subcommittee Meeting (AHB20(2)), Transportation Research Board, Washington DC, "NCHRP 03-96: Analysis of Managed Lanes on Freeway Facilities." Jan. 13, 2013.
19. Berman, Jeffrey W. 2013 National Institute of Standards and Technology, "Large-Scale Evaluation of Steel Gravity Framing Structural Integrity: Experiments, Modeling Recommendations, and Future Work." Gaithersburg, MD, June 2013.
20. Berman, Jeffrey. Pennsylvania State University, Structural Engineering Seminar, Recent Advances in Steel Plate Shear Walls, April 2013.
21. Invited Talk, In-situ change detection using 3D laser scanning, Oregon Surveyors' Conference, Salem, OR, March 19, 2013.
22. Invited Talk, Guidelines for the use of Mobile LIDAR in transportation applications, Oregon Surveyors' Conference, Salem, OR, March 19, 2013.

23. Sage, J. "Transportation Infrastructure Investment Prioritization: Responding to Regional and National Trends and Demands." Presented to the Washington State Transportation Commission, Olympia, WA, April 16, 2013.
24. Sage, J. "Prioritization for Infrastructure Investment in Transportation." Presented to the Department of Civil Engineering, Washington State University, Pullman, WA, April 5, 2013.

### ***Inventions, patent applications***

1. University of Idaho KLK844 Patent- A bolt-in rear drive system for a snowmobile
2. University of Washington USPTO Provisional Patent Application in preparation: Travel Pattern Discovery Using Mobile Device Sensors, the UWC4C tracking number 45830.01US1.
3. University of Washington Spatiotemporal System for Video-based Vehicle Detection, Patent No. US 8,358,808 B2. Received on Jan. 22, 2013.

### ***Other products (PacTrans members are in bold)***

1. Xiaofeng Chen, K. Henrickson, and **Y. Wang**, University of Washington. "Kinect-based Pedestrian Detection System", coded using C, 2013.
2. Sage, Jeremy, **K. Casavant** and C. Lawson. Washington State University. FPTI Research Report #13. Full Reciprocity Plan Financial Impact Study Review: Final Compilation Report. March 2013.

### **3. Participant and Collaborating Organizations: Who has been involved?**

- **What individuals have worked on the program?**
- PacTrans Director, Yinhai Wang, Ph.D., professor of Civil and Environmental Engineering at the University of Washington (UW), devotes 50 percent of his time directing PacTrans. Dr. Wang has overall responsibility for program management, oversight of PacTrans operations, including the Research Committee, the Education and Workforce Development Committee, and the Outreach and Technology Transfer Committee, and Student Leadership Council. He is the regional and national leadership for PacTrans, and the contact person for management relationships with USDOT Research and Innovative Administration (RITA) and other USDOT organizations.
- PacTrans Associate Director in Research, Linda Ng Boyle, Ph.D., associate professor with joint appointments in Industrial and Systems Engineering, and Civil and Environmental Engineering at the UW spends 15 percent of her time managing the research program for PacTrans and coordinates the research collaboration across the five partner institutions.
- PacTrans Associate Director in Education and Workforce Development, Anne Vernez-Moudon, Dr. es SC, Professor of Architecture, Landscape Architecture, and Urban Design and Planning, Adjunct Professor of Epidemiology and in Civil and Environmental Engineering, devotes 10 percent of her time leading the Education and Workforce Development Committee. She is involved in curriculum



changes, professional training program development, and educational enhancements among the partner institutions.

- PacTrans Associate Director in Outreach, Mark Hallenbeck is also the Director of the Washington State Transportation Center (TRAC) office located at the UW. Mr. Hallenbeck works closely with Associate Director Anne Vernez-Moudon on organizing student seminars, internships and fellowship programs.
- PacTrans Associate Director in Oregon State University (OSU), Chris Bell, Ph.D., professor of Civil and Environmental Engineering at OSU, devotes 10 percent of his time to managing and organizing the education, outreach, and research activities within OSU. He coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in the University of Alaska Fairbanks (UAF), Billy Connor, Director of the Alaska University Transportation Center (AUTC), devotes 10 percent of his time to managing and organizing the education, outreach, and research activities within UAF. He coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in University of Idaho (UI), Karen Den Braven, Ph.D., professor of Mechanical Engineering at UI, devotes 10 percent of her time to managing and organizing the education, outreach, and research activities within UI. She coordinates all results and outcomes with the UW on a regular basis.
- PacTrans Associate Director in Washington State University (WSU), Dave McLean, Ph.D., professor of Civil and Environmental Engineering at WSU, devotes 10 percent of his time to managing and organizing the education, outreach, and research activities within WSU. He coordinates all results and outcomes with the UW on a regular basis.
- Center staff at the UW includes full-time Assistant Director, Ms. Meghan MacKrell, who devotes 100 percent of her time to the day-to-day operations in support of the PacTrans mission. Her responsibilities include project management, grant management, social media and outreach, and managing the PacTrans operations team. PacTrans also has a second full-time Fiscal Specialist, Ms. Eva Lu, who devotes 100% of her time to fiscal matters of the center and projects. Additionally, PacTrans has a number of grad students who help out on various projects.
- The Student Leadership Council, composed of graduate students at all Consortium partner universities, is an active part of the PacTrans management structure. The Student Leadership Council facilitates student and center communications and plans their own activities. For example, one important student event already on the PacTrans schedule is the Region 10 Student Conference, set to be held on the UW campus in October 2013. Leaders of the three UTCs in this region – PacTrans, the National Institution for Transportation and Communities (NITC), and Transportation for Livability by Integrating Vehicles and the Environment (TranLIVE) – will all assist in the sponsorship of this conference.

- **What other organizations have been involved as partners?**

- The state transportation agencies in Alaska, Idaho, Oregon, and Washington have all been extensively involved in PacTrans in terms of research, outreach, and technology transfer activities. Their research office directors are members of our PacTrans External Advisory Board (EAB), which provides strategic oversight to the PacTrans Board of Directors. In addition to the state DOTs, many other public transportation agencies and private companies are also actively involved in PacTrans activities.
- The PacTrans EAB provides strategic guidance to the PacTrans Board of Directors. In addition to state DOT members on the PacTrans EAB, membership includes a representative from Toyota Corporate, Port of Portland, the Puget Sound Regional Council (PSRC), as well as a representative from Idaho industry, Western Trailers.
- On February 27, 2013, PacTrans invited Carnegie Mellon University and Green Design Institute Co-Director Chris Hendrickson to give the talk “Electric Vehicles and Life Cycle Assessment” as part of the ongoing PacTrans Seminar Series. On April 19, 2013, PacTrans invited Region 9 UTC (at UC Berkeley) Director Robert Cervero to give the talk “Sustainable Mobility, Place-making, and Economic Competitiveness: Striking a Balance.” Both seminars were well-attended by UW students and faculty, as well as by members of private industry and the Seattle DOT.
- PacTrans also collaborates with Portland State University’s UTC (NITC) and University of Idaho’s TranLIVE on various Region 10 events.

- **Have other collaborators or contacts been involved?**

- The Spring 2013 CEE 500 Transportation and Construction Seminar, a graduate course taught by PacTrans Director Yin Hai Wang, invited the following eight transportation professionals from private industry and local and state agencies:
  - o April 5: Mr. Bruce Haldors from Transpo Group “What Transportation Can Be: Innovative and Comprehensive Transportation Solutions”
  - o April 12: Mr. Shuming Yan from WSDOT “Exploring Toll Financing at WSDOT SR 167 Extension Comprehensive Tolling Study”
  - o May 3: Mr. Peter Koonce from Portland Bureau of Transportation “Innovations in Multimodal Traffic Signals: Implementing the best from Delft Denmark in Portland”
  - o May 10: Mr. Erik Saganic from Puget Sound Clean Air Agency “Puget Sound Transportation Pollution Policy and Research”
  - o May 17: Mr. Joe Story from DKS “Forecasting Variability in Travel Demand: Context, Research and Applications for the Future”
  - o May 24: Prof. Heng Wei from Univ. of Cincinnati “Integrated Transportation Conformity Analysis”

- May 31: Mr. Michael Williams from Sound Transit “Sound Transit Projects and Plans for a Potential Public Vote”
- June 7: Mr. Stevan Gorcester from Transportation Improvement Board “LEAN Business Processes at the Washington State Transportation Improvement Board”

#### 4. Impact

- **What is the impact on the development of the principal discipline(s) of the program?**

The impact to our transportation program has been quite substantial and reaches across our education program, our collaboration with others in the region, and the research we can do on a regional level, which has outcomes of national importance.

We are now able to provide our students fellowship and travel support, which allow our consortium institutions to attract high-caliber students and showcase them at various workshops, seminars, and conferences. We have also been able to foster better collaborations with our state and local agencies, thus strengthening the regional ties. The interaction among amazing students and local industries has also helped us continually improve our education curriculum at the undergraduate and graduate level. We are currently working on an education project to provide transportation material to those who may not have the opportunities to be a part of a larger institution, and develop senior design projects that connect local industry with future workers.

- **What is the impact on other disciplines?**

The transportation research projects that PacTrans has been involved in reaches out to many other disciplines. Among the five institutions, the research, outreach, and education work has impacted those in the Colleges of Engineering, Economics, Built Environment, Public Health, and Liberal Arts & Sciences.

- **What is the impact on transportation workforce development?**

PacTrans is making solid progress in transportation workforce development. While continuing an award-winning intern program with WSDOT, PacTrans is developing new intern programs for students with public and private partners. Additionally, within the last two academic quarters, several new courses have been added to the curriculum in the Dept. of Civil and Environmental Engineering at the UW. For example, King County DOT traffic engineer Kevin Chang’s geometric design course and CH2M Hill transportation engineer Tony Woody’s simulation course offer students knowledge critical for their future work. Also, discussions are ongoing with Seattle City Traffic Engineer Dongho Chang, on re-establishing Transpeed, a short-term transportation training program for working professionals. Moreover, the online “Sustainable Transportation” master’s program, which started last year, has already attracted nearly 40 transportation professionals to the program.

- **What is the impact on physical, institutional, and information resources at the university or other partner institutions?**

PacTrans has funded seven regional projects and fifteen small projects. These projects add new physical, institutional, and information resources and facilitate cross sharing of existing resources. For example, of the seven regional projects, the OSU-led “Educating Teenage Drivers in the Pacific Northwest Regarding the Dangers of Distracted Driving” project involves outreach on the dangers of distracted driving to thousands of high school students across the region. All consortium institutions are involved in this project and their state-of-the-art driving simulators are simultaneously utilized in this project. The WSU-led “Digital Dissemination Platform of Transportation Engineering Educational Materials Founded in Adoption Research” project focuses on improving the synergy between higher education and workforce development efforts through evaluation of online curriculum and the testing of new online materials for working professionals taking courses at PacTrans consortium universities.

- **What is the impact on technology transfer?**

PacTrans emphasizes technology transfer and involves relevant parties early in those funded projects with a technology development component. Its regional transportation conference scheduled in October 2013 will offer a great platform for researchers and practitioners to talk about potential technologies for transfer. Also, the PacTrans STAR Lab maintains the state of the practice hardware currently utilized by WSDOT and other local transportation agencies. These hardware and software applications utilized in UW transportation courses and research are helpful for researchers to target the right problems for technology development.

- **What is the impact on society beyond science and technology?**

Transportation ties to everyone’s daily life. We strongly believe that transportation improvement will directly benefit people’s quality of life and environmental conservation. Also, our work is contributing to a greater understanding and appreciation of the importance of collaboration between the public and private spheres around transportation issues in not only the Pacific Northwest, but across the U.S. and abroad.

## **5. Changes/Problems**

Due to a career change, Washington State University Associate Director David McLean resigned his position on the PacTrans Board of Directors in June 2013. He was replaced by Dr. Ken Casavant, Professor in the School of Economic Sciences at Washington State University.

## **6. Special Reporting Requirements**

None.