

PROJECT NUMBER (given by the VREF)	CoE-2012-01
PROJECT TITLE	METROFREIGHT: the Local/Global Challenge of Urban Freight
NAME OF THE HOST INSTITUTION	University of Southern California (USC)
NAME OF THE PROJECT LEADER	Genevieve Giuliano
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NAMES OF THE MAIN CORE PARTNERS IF APPLICABLE

1	UNIVERSITIES/ORGANIZATIONS	USC Sol Price School of Public Policy, METRANS Transportation Ctr
	NAME OF THE PERSON RESPONSIBLE	Genevieve Giuliano, Director and Professor
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2	UNIVERSITIES/ORGANIZATIONS	California State University, Long Beach (CSULB)/CITT
	NAME OF THE PERSON RESPONSIBLE	Thomas O'Brien, Executive Director
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3	UNIVERSITIES/ORGANIZATIONS	Universite Paris Est, IFSTTAR, AME
	NAME OF THE PERSON RESPONSIBLE	Laetitia Dablanc, Director of Research
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4	UNIVERSITIES/ORGANIZATIONS	Hofstra University/USDOT Region 2 University Transportation Ctr
	NAME OF THE PERSON RESPONSIBLE	Jean-Paul Rodrigue, Professor
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5	UNIVERSITIES/ORGANIZATIONS	The Korea Transport Institute (KOTI), Seoul Korea
	NAME OF THE PERSON RESPONSIBLE	Sangbeom Seo, Research Fellow
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START OF PROJECT: (YYYY-MM-DD)	2013-05-24
END OF PROJECT: (YYYY-MM-DD)	2017-12-31
TOTAL PROJECT TIME:	
TOTAL GRANT AWARDED IN SEK	19,288,325
GRANT AWARDED LAST YEAR IN SEK	6,000,000
GRANT REQUESTED FOR NEXT YEAR IN SEK	7,767,063

SIGNATURE, PROJECT LEADER	
University of Southern California	GENEVIEVE GIULIANO
Los Angeles, California	
October 1, 2016	
_____	_____
(Place and date here)	(Project leader's name in capital letters and signature here)

SECTION 1:

SUMMARY OF MAIN CONTRIBUTIONS AND IMPACT (max 2 pages)

Main scientific contributions

MF (MF) has continued its research program as described in the original proposal. We have a total of 42 projects, with 15 completed and 27 in progress. See Table 1 for list of completed projects during Year 4. This year MF researchers generated 20 refereed publications, 10 research reports, and 4 other publications. They have submitted an additional 15 papers to peer reviewed journals. They gave presentations at several conferences: 20 colleagues participated in WCTR 2016. Eight researchers will present papers at the VREF Urban Freight Conference 2016.

Table 1: Completed research projects during Year 4

Theme/Title	Authors
Phase 1: Freight flows and their impacts 1.A Building the database 1.B The urban freight landscape atlas	Giuliano, Dablanc, Rodrigue, Seo, Kang Rodrigue, Dablanc, Giuliano, Seo
Theme 1: Role of policy from industry perspective 1.1c Congestion caused by urban freight	Beziat, Dablanc, Koning
Theme 2: Last mile strategies 2.1c Feasibility of consolidated freight deliveries 2.1d City logistics strategies for CBDs	Heitz Seo, Ahn, J-S Lee
Theme 3: Improving passenger freight interaction 3.2a Impacts of growing non-motorized infrastructure on freight operations, accessibility	Conway
Theme 4: Land use dynamics 4.1c The dualism of urban freight transport	Rodrigue, Behrends

Honors and awards: Petros Ioannou was installed as the inaugural A.V. “Bal” Balakrishnan Chair, USC Ming Hsieh Department of Electrical Engineering. Genevieve Giuliano was named the UCLA Lewis Center 2016 Harvey Perloff visiting professor. Laetitia Dablanc was named visiting professor, Gothenburg University. Alison Conway and co-authors received the 2016 WCTR Best Paper award for the Freight Transport and Logistics track. She and student co-authors also received one of two best paper awards from the TRB Urban Freight Committee. Sangbeom Seo and Jee-Sun Lee received an excellence in research award from the Korean National Research Council for Economics. Quan (Jack) Yuan, USC PhD student, and Quanquan Chen, CCNY PhD student, were each awarded a VREF Study Visit Grant, and Linette Prasad, CCNY undergraduate student, received an Eisenhower Fellowship. Laetitia Dablanc was selected president of the WCTR young members section.

Educational contributions

The MF project is helping to formalize urban freight as an academic field of inquiry, beyond traditional logistics and systems engineering programs.

Curriculum Guide: The Urban Freight Curriculum Guide continues to be periodically updated. It is accessible via the MF website. The Guide is a searchable database organized by educational focus area (elementary and high school, post-secondary, professional development and community-based education) and type (syllabus, journal article, etc.), and helps us to identify the current state of the art in urban freight education.

University education: MF’s collaborative graduate course in Urban Freight was offered for the first time in Spring 2016 by CCNY (Conway) with participation of USC (Giuliano). It is being revised and will be offered for the second time in Spring 2017. Course materials will then be made available for use by other instructors. Dablanc taught three short urban freight courses, two at University of Paris-East and one at EFPL, Switzerland. These will be repeated in the coming year. Giuliano taught a short course on port governance and port-related sustainability efforts. There are 12 PhD students working on MF projects as part of dissertation research.

Professional training: Two short courses have been developed, one for policymakers and one for the goods movement industry. The first was piloted December 2015 in Paris (Dablanc and O’Brien) with 16 trainees from

French local governments participating. It will be offered again in Spring 2017. The second course is under development and scheduled to be offered in partnership with LA Metro in Spring 2017. The course is being developed in conjunction with another for LA Metro staff. Both focus on ways to incorporate freight into the planning process for developments within the urban core.

Main communication activities

Media program: The MF website is a primary communications channel. It provides general information on MF, lists all research projects, events, publications, podcasts, webinars, and videos. It includes social media channels, such as Facebook, Twitter and LinkedIn. IFSTTAR publishes a four-to-six-page MF newsletter (three issues in total for 2016) and beginning this year, versions are being translated into English for posting in both languages. The *METRANS News* includes a MF section in every issue. Our new weekly student e-newsletter, *METRANS on the Move*, includes MF events as they occur. The *METRANS Perspectives Blog* covers all METRANS-affiliated center topics. Most recently, Knatz, O'Brien and Rodrigue wrote on the Hanjin bankruptcy.

Outreach to professional community: MF researchers communicate research and expertise through participation in national, state and local planning, policy, and implementation. Giuliano participated in the VREF/RPA publication, *Why Goods Movement Matters*. Rodrigue participated in a New York City Freight Forum focus group in April 2016. See policy related activities in next section. Knatz and Rodrigue participated in the 14th annual meeting of the Port Performance Research Network (PPRN) on August 23, 2016 in Hamburg, Germany as part of the Annual Meeting of the International Association of Maritime Economists. In September 2016, Jee-Sun Lee and Nathan Hutson, USC PhD student, participated in the IDTP-MOBILIZE conference in Yichang, China.

Influencing policy and practice

Los Angeles: Giuliano and O'Brien are members of California's Freight Efficiency Strategies Working Group, formed to provide input to the California Sustainable Freight Action Plan. They led subcommittees and wrote white papers presenting recommended strategies for the plan. The Working Group will now advise on implementing the CSFAC.

New York: Conway is developing a comprehensive guidebook on accommodating freight in complete streets, in collaboration with NYC DOT and NYSEDA. It will be presented to practicing engineers and planners at meetings throughout New York State. Conway also participated in an expert focus group with the NYC Mayor's Office of Sustainability to identify strategies to reduce greenhouse gas emissions from the freight sector. Ben Miller and his development team and consultants have moved his MF research project on waste management into the pre-implementation phase with funding from New York State. The plan is to construct pneumatic tubes to transport compressed waste from east Manhattan to rail cars, which would deliver directly to disposal facilities.

Paris: MF Paris team is involved in several City of Paris Freight Forum initiatives. The new Paris Low Emission Zone ordinance directly benefited from MF research project 2.2a. MF contributed to the freight and logistics content of the new Paris land use ordinance (PLU) as well as the identification of some of Paris urban freight data. MF is a formal support organization of CITYLAB. Laetitia Dablanc is active in several research tasks of CITYLAB, including setting up an Observatory on new trends impacting urban freight. Dablanc co-organized the CITYLAB Paris event on May 24-25, 2016, with several Metrofreight Paris team members active in the event preparation and moderation, including urban freight site visits.

Seoul: KOTI continued to provide assistance to the Korea National Logistics Master Plan, as well as to logistics park developers.

SECTION 2:**DEVIATIONS FROM THE PROJECT PLAN FOR THE REPORT PERIOD, AND HOW THESE HAVE BEEN MANAGED BY THE COE/PROJECT LEADERSHIP (max 1 page)**

No major deviations have taken place that changed funding levels or themes. However, several minor changes in the following research projects have occurred.

- Project 1.1b Understanding demand for curb space and access for New York City deliveries is now part of 5.1a (Conway) and the title has been changed to Decomposing the Home-Based Delivery Supply Chain. This adjustment is due to the transition of David King to Arizona State University. The budget for David's research was shifted to Alison Conway's project.
- Project 4.1e Extending freight landscape model was removed. The San Francisco part was completed with other funds (Tier1 UTC); the Paris part is MF project 4.2b (Dablanc).
- Project 4.2a Developing and testing the freight landscape was removed. Work is being done as 4.1.a (Giuliano).
- Project 5.3b Seoul e-commerce and home delivery pattern changes was removed. The research will be part of 5.1b (Seo, J-S Lee).

In case the deviations have led to changes in the work plan and/or project organization for the remaining part of the CoE/project, please explain these changes here, and how they have affected the time schedule and budget for the CoE/project.

There has been an overall reduction in activity of MF in 2016 due to the reduced level of funding. The strong US dollar relative to the Swedish Krona reduced the budget by about 20% relative to the funding anticipated in the proposal.

SECTION 3:

SUMMARIZED WORK PLAN FOR THE COMING YEAR (max 1 page)
DESCRIBE THE MAIN TARGETS AND ACTIVITIES IN THE COE/PROJECT IN THE COMING YEAR

The main tasks for Year 5 will be 1) completing all remaining research projects; 2) extending research on Themes 4 and 5; 3) continuing education and research activities; 4) developing final products to consolidate the MF research, education and outreach accomplishments; and 5) exploring opportunities to maintain the MF center. Completing research projects: There are 27 projects in progress. Some are ongoing projects planned to continue through Year 5; others are Year 3 and 4 projects that due to the lags in funding are scheduled for completion this year or next year. Due to space limitations we simply summarize the projects by theme. Project descriptions are available on the MetroFreight website.

Extending Themes 4 and 5: The research in New York, Paris and Seoul on e-commerce provides a unique opportunity for comparative work. Freight landscape research is being extended to other metro areas and other aspects of land use. More of the Paris freight survey data is available and will be used for more analysis of urban freight flows.

Table 2: Research projects in progress

Theme	Projects
Theme 1: Role of policy from industry perspective	1.1d, 1.1f, 1.1g, 1.2a
Theme 2: Last mile strategies	2.1b, 2.1d, 2.1e, 2.1f, 2.1g, 2.2c, 2.2d, 2.3a
Theme 3: Improving passenger freight interaction	3.1a, 3.2c, 3.2d, 3.2e
Theme 4: Land use dynamics	4.1a, 4.1b, 4.1f, 4.1g, 4.1h, 4.1i, 4.1j, 4.2b
Theme 5: Changing production and consumption	5.1a, 5.1b, 5.3a

Continuing education and outreach products: The urban freight graduate course curriculum will be made available on our website. We anticipate teaching the course once each year, as long as there is sufficient demand. The training and professional development courses will continue in Year 5, and the Curriculum Guide will continue. The MF communications program will continue. The major activity is I-NUF 2017, to be held October 17-20 at the Hyatt Regency, Long Beach. The conference will be jointly sponsored by METRANS and MF.

Final products: We are discussing special issues of journals to feature summary papers of the main MF contributions. There will be a special session at I-NUF 2017 for the same purpose. A compendium of most significant MF papers may be produced by MF.

Maintaining MF Center: At our Seoul meeting all partners agreed that MF has made significant research and education contributions, and that the network we have established has great value for each of us and hence is well worth continuing. Without additional funding it will not be possible to continue anything but the network itself, because centers require core funding to exist. We will be discussing additional funding possibilities with VREF in the coming months.

Table 3: Year 5 Funding request

Cost Categories	Proposed	Notes on Year 5 Funding Request
STAFF COSTS (incl. Fringe Benefits) for USC, CCNY, CSULB, IFSTTAR, KOTI	\$496,079.00	Director, Co-P.I.s, Program Administrator, Faculty Researchers, Graduate student salaries
MATERIALS; COURSES AND SEMINARS	\$29,656.00	Educational, training and research supplies; Urban Freight graduate course, training and development
TRAVEL	\$24,413.00	Travel to partner meetings, TRB and I NUF
TUITION AND GRA HEALTH FEES	\$31,500.00	Tuition costs and health fees for GRAs
UNIVERSITY OVERHEADS (F&A)	\$172,883.00	USC 50%, CCNY 56%, CSULB 26%, IFSTTAR 8%, KOTI 9%
UNDEDICATED FUNDS	\$150,000.00	Undedicated funds required by VREF
TOTAL PROJECT FUNDS REQUESTED	\$904,531.00	
SEK (exchange 09/30/16 = 8.56449)	\$7,746,846.70	

SECTION 4:

FINANCIAL REPORT (max 1 page)

Table 5: Use of Year 4 VREF Funds through June 30, 2016

Cost Categories	VREF Funds Year 4	Use	Balance to be expended through 12/31/16
STAFF COSTS (incl. Fringe Benefits) for USC, CCNY, CSULB, IFSTTAR, KOTI	\$445,852.00	\$363,031.47	\$82,820.53
MATERIALS (Includes subcontracting & translation)	\$22,052.00	\$12,415.11	\$9,636.89
TRAVEL	\$54,425.00	\$47,642.52	\$6,782.48
COURSES, SEMINARS, ETC.	\$9,000.00	\$5,234.90	\$3,765.10
TUITION AND GRA HEALTH FEES	\$23,214.00	\$11,182.73	\$12,031.27
UNIVERSITY OVERHEADS (F&A)	\$168,253.00	\$138,299.75	\$29,953.25
TOTAL PROJECT COSTS	\$722,796.00	\$577,806.48	\$144,989.52
SEK exchange on receipt date = 8.3010974	\$6,000,000.00	\$4,796,427.87	\$1,203,572.13

Use of VREF funds includes compensation for Center Director, Co-P.I.s, research faculty, project manager, GRAs. Materials category includes translation services, purchase of research supplies, software, books, training materials and cost of conference calls. Travel to partner meetings in Washington, D.C., California, Seoul, Korea; conferences in Sweden and Germany; local seminars attended in partners’ respective countries. MF Urban Freight courses and outreach through joint seminars were offered. 25% of GRA tuition and health fees. F&A: USC 50%; CCNY 56%, CSULB 26%, IFSTTAR 8% and KOTI 9%.

Table 6: Use of Yr 4 COST SHARE Funds through June 30, 2016

Cost Categories	COST SHARE Funds Year 4	Use	Balance
STAFF COSTS (incl. Fringe Benefits) for USC, CCNY, CSULB, IFSTTAR, KOTI	\$211,844.00	\$80,805.96	\$131,038.04
MATERIALS	\$1,000.00	\$0.00	\$1,000.00
TRAVEL	\$5,000.00	\$2,514.00	\$2,486.00
COURSES, SEMINARS, ETC.	\$5,000.00	\$3,556.00	\$1,444.00
TUITION AND GRA HEALTH FEES	\$63,928.00	\$10,653.27	\$53,274.73
UNIVERSITY OVERHEADS (F&A)	\$40,230.00	\$42,042.95	(\$1,812.95)
TOTAL COST SHARE	\$327,002.00	\$139,572.18	\$187,429.82
SEK exchange = 8.3010974	\$2,714,475.45	\$1,158,602.26	\$1,555,873.19

MetroFreight partners cost share in compensation for Center Director, Co-P.I.s, researchers, project manager, and supplement travel costs to all partner meetings in U.S.A., Europe and Asia. MF partners host seminars and training courses in their respective areas. 75% of GRA tuition sponsored by university partners. All direct costs incur full university overhead costs.

SECTION 5:

LIST OF SELECTED PUBLICATIONS AND OTHER DISSEMINATION DELIVERABLES (max 2 pages)

Due to space limitations we list here only peer reviewed publications, published or submitted. We do not include book chapters, reports, or general publications.

Peer reviewed, published or forthcoming

- Acciaro, M., T. Vanelslander, C. Sys, C. Ferrari, A. Romboutsos, G. Giuliano, J. Lee-Lam, and S. Kapros (2014) Environmental sustainability in seaports: A framework for successful innovation, *Journal of Maritime Policy and Management*, 41(5), 480-500.
- Baudel, T., L. Dablanc, P. Aguiar-Melgarejo, and J. Ashton (2016) Optimizing Urban Freight Deliveries: From Designing and Testing a Prototype System to Addressing Real Life Challenges. In Taniguchi, E. & Thomson, R. (Ed.) *Transportation Research Procedia*, 12, Tenth International Conference on City Logistics, 170-180.
- Beziat A., F. Toilier (forthcoming) Using urban forms to characterize logistics profiles - The geography of freight movements in the city of Paris. *Proceedings, World Conference on Transport Research*, Shanghai, China.
- Beziat, A., P. Launay, and F. Toilier (forthcoming) Analysis of different types of freight tours according to their logistics organization in the Paris region. *Transport Policy*.
- Conway, A., N. Tavernier, V. Leal-Tavares, N. Gharahmani, L. Chauvet, M. Chiu, and X. Yeap (2016) Freight in a Bicycle-Friendly City: An Exploratory Analysis. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2547, p. 91-101.
- Cruz, C. and A. Montenon (2016) Implementation and impacts of low emission zones on freight activities in Europe : Local schemes versus national schemes. In Taniguchi, E. & Thomson, R. (Ed.) *Transportation Research Procedia* 12, Tenth International Conference on City Logistics, 544-556.
- Dablanc, L. (2017) City Logistics in *The Wiley-AAG International Encyclopedia of Geography: People, the Earth, Environment, and Technology*.
- Dablanc, L., and J-P. Rodrigue (forthcoming) Urban Freight Distribution: a Global Typology, in G. Giuliano and S. Hanson (Eds.) *The Geography of Urban Transportation*, 4th Edition, New York: The Guilford Press.
- Heitz A., and A. Beziat (2016) The parcel industry in the spatial organization of logistics activities in the Paris region: inherited spatial patterns and innovations of urban logistics systems. In Taniguchi, E. & Thomson, R. (Ed.) *Transportation Research Procedia*, 12, Tenth International Conference on City Logistics, 812-824.
- Heitz A., and J. Debie (forthcoming) The location of logistic activities in metropolitan areas: An issue of urban planning? The case of Paris. *World Conference on Transport Research*, Shanghai, China, forthcoming in the Proceedings.
- Koning, M., and A. Conway (2016) The Good Impacts of Biking for Goods: Lessons from Paris City. *Case Studies on Transport Policy*, <http://dx.doi.org/10.1016/j.cstp.2016.08.007>.
- Launay, P. (forthcoming) Potential and limitations of collective parcel delivery systems in Paris, World Conference on Transport Research, forthcoming in the Proceedings.
- Oliveira, L.K., O.R. Santos, R. Nobrega, and L. Dablanc (forthcoming) The geography of warehousing in Belo Horizonte (Brazil) 14th World Conference on Transport Research - WCTR 2016, forthcoming in the Proceedings.
- Rodrigue, J-P. (2016) *The Geography of Transport Systems*, Fourth Edition, London: Routledge. In press.
- Rodrigue, J-P., and A. Ashar (2016) Transshipment Hubs in the New Panamax Era: The Role of the Caribbean, *Journal of Transport Geography*, 51, 270-279.
- Rodrigue, J-P., L. Dablanc, and G. Giuliano (forthcoming) The Freight Landscape: Convergence and Divergence in Urban Freight Distribution, *Journal of Transport and Land Use*.
- Santos, O.R., L. K. Oliveira, R. Nobrega, and L. Dablanc (2016) Expansão urbana em belo horizonte e as implicações no transporte urbano de mercadorias. In: 7º Congresso Luso-Brasileiro de Planeamento Urbano, Regional e Integração Sustentável, 2016, Maceió. Livro de Acta.

- Seidel, S., N. Marei, and C. Blanquart (2016) Innovations in e-grocery and logistics solutions for cities. In Taniguchi, E. & Thomson, R. (Ed.) *Transportation Research Procedia*, 12, Tenth International Conference on City Logistics, 825-835.
- Woudsma, C., P. Jakubicek, and L. Dablanc (2016) Logistics sprawl in North America: methodological issues and a case study in Toronto. In Taniguchi, E. & Thomson, R. (Ed.) *Transportation Research Procedia*, 12, Tenth International Conference on City Logistics, 474-488.
- Zhang, Y., and P. Ioannou (forthcoming) Combined Variable Speed Limit and Lane Change Control for Highway Traffic, *IEEE Transactions on Intelligent Transportation Systems*.
- Zhao, Y., and P. Ioannou (2015) Positive Train Control with Dynamic Headway Based on an Active Communication System, *IEEE Transactions on Intelligent Transportation Systems*, 16, 6, 3095-3103.

Peer reviewed publications, submitted

- Behrends, S., and J-P. Rodrigue (2016) The Dualism of Urban Freight Distribution: City vs. Suburban Logistics, submitted for publication, *Journal of Transport Geography*.
- Camilleri, P., and L. Dablanc (2016) A methodology for assessing the potential of electric vehicles with French commercial vans as a case study. Submitted to *Transportation Research Board 2017*.
- Chen, Q., and A. Conway (2016) The Traffic Impacts of Residential Delivery Activity: A New York City Case Study. Submitted for *Transportation Research Record: Journal of the Transportation Research Board*.
- Chen, Q., and A. Conway (2016) Parking for Residential Delivery in New York City: Regulations and Behavior. Submitted for *Transport Policy*.
- Conway, A., J. Cheng, C. Kamga, and D. Wan (2016) Cargo Cycles for Local Delivery in New York City: Performance and Impacts, submitted to *Research in Transportation Business and Management*.
- Giuliano, G., S. Kang, and J. Yuan (2016) Using proxies to describe the metropolitan freight landscape, revised and resubmitted to *Urban Studies*.
- Fu, L., and M. M. Dessouky (2016) Models and Algorithms for Dynamic Headway Control for Rail Operations, submitted to *Computers & Industrial Engineering*.
- Fu L., and M. M. Dessouky (2016) The State-dependent Shortest Path Problem for the Train Routing Problem with Double Track Segments, submitted to *Journal of Scheduling*.
- Heitz A., L. Dablanc, and L. A. Tavasszy (2016) Logistics sprawl in monocentric and polycentric metropolitan areas: The cases of Paris, France, and the Randstad, the Netherlands. Submitted to *Region*.
- Heitz A., and J. Debrie (2016) De la planification à la programmation urbaine de la logistique en Ile-de-France: enjeux, expérimentations, limites, Submitted in June 2016 to *Géographie, Espace et Société*.
- Heitz, A., P. Launay, and A. Beziat (2016) Rethinking Data Collection on Logistics Facilities: A New Approach for Measuring the Location of Warehouses and Terminals in Metropolitan Areas, Submitted to *Transportation Research Board 2017*.
- Kolar, P., and J-P. Rodrigue (2016) Container Port Selection by Freight Forwarders in the Landlocked Czech Republic, submitted for publication, *European Journal of Transport and Infrastructure Research*.
- Motte-Baumvol, B., C. Belin-Munier, L. Belton-Chevallier, L. Dablanc, and E. Morganti (2016) Spatial dimensions of e-shopping in France. Presentation at the World Conference on Transport Research, Shanghai, China, July 10-15, 2016. Submitted to *Asian Transport Studies*.
- Oliveira, L. K., O. R. Santos, R. A. A. Nóbrega, L. Dablanc, and R. L. M. Oliveira (2016) Análise do espraioamento logístico: Um estudo para a região metropolitana de Belo Horizonte. *Transportes*.
(<https://www.revistatransportes.org.br/anpet>)
- Witte, P., B. Wiegman, and J-P. Rodrigue (2016) Competition or Complementarity in European Inland Port Development: A Case of Overproximity?, submitted for publication, *Journal of Transport Geography*.
- Zhao, Y., P. Ioannou, and M. M. Dessouky (2016) Routing of Multimodal Freight Transportation Using a Co-simulation Optimization Approach. Submitted to *Transportation Research Board 2017*.