Global Trade, Transportation and Logistics Studies (GTTL)

Interdisciplinary Certificate Program

Self–Study Narrative

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Self–Study Narrative

Global Trade, Transportation and Logistics Studies (GTTL) Interdisciplinary Certificate Program

A. Overview of Program Strengths and Limitations

Global Trade, Transportation and Logistics Studies (GTTL) offers a novel and exciting interdisciplinary certificate program. Since its inception in the summer of 1995, GTTL has trained students in methods essential to understanding today's emerging global economy. GTTL draws on expertise of faculty from 16 UW departments and of business and government leaders to provide instruction in supply chain management, product logistics, transportation, electronic commerce, intermodalism, infrastructure improvement, partnerships and strategic alliances. None of the 16 departments, on its own, could have launched such a program because faculty interest in GTTL topics is often limited to a few in each department.[1] Student interest in GTTL has been high, as indicated by the steady increase in student enrollment to a current level of over 120 students (**Exhibit H.f.1** in the Appendix).

In the first few years we focused much of our energy inward to establish a quality curriculum. While continuing to refine the curriculum, we have increasingly looked outward as we approached groups with common interests in business, government, professional societies, and alumni. We have accomplished a great deal and in many respects have exceeded our original goals (described in the next section). The following narrative self-study describes our achievements, strengths, and challenges in light of the vision that brought us together a decade ago. This self-study follows fairly closely the University guide for existing program review, although our program is relatively new and does not offer academic degrees.

GTTL History and Program of Study. From the beginning the mission of the Global Trade, Transportation and Logistics Studies Program has been to satisfy the needs of business and government with students knowledgeable about global commerce. The GTTL Program was first envisioned in 1995. The Vice Provost for Research at the UW (Alvin Kwiram) became aware of unmet needs on the part of various business and government organizations, and established an investigation team called the Working Group on Transportation (WGT). The WGT, in turn, organized an industry panel. This panel provided a compelling rationale to the University of the need for well-educated university graduates in the Pacific Northwest knowledgeable about global transportation and logistics issues. The WGT found that relevant courses exist in many academic departments, but are not well known to students from other departments. These courses were also poorly coordinated with respect to class size and prerequisites. The Final

[1] Understandably, discipline-based departments are concerned with specific topics most relevant to that discipline. Systems integration of GTTL-related topics has gotten very little attention. When faculty and student interests across departments are combined, a sizable education and outreach program has arisen.

Report of the WGT specifically recommended the establishment of a "certificate program" that would be University-wide and interdisciplinary, and integrate the topics of global trade, transportation and logistics.

The GTTL Certificate Program, formally adopted by the Graduate School June 9, 1995, was designed to enable professionally-oriented graduate students to augment their degree programs in preparation for careers that demand integral knowledge of trade, transportation and logistics. The mix of specialties that has been built into GTTL curriculum mirrors the real world of the global economy, with particular attention to activities involved in the flow of goods from point of origin to point of consumption across international boundaries. These activities include: manufacturing, procurement, distribution, transportation modes (maritime, aviation, and surface), inter-modal connections, and supply chain management. Issues related to advancements in security, telecommunications, information, infrastructure, the environment, humanitarian relief, energy, regulatory and other systems that facilitate or constrain global commerce are considered as well. All University of Washington graduate and professional students are eligible for the GTTL Certificate. The majority of GTTL Certificate Candidates come from the following units:

College of Education
College of Forest Resources
Department of Aeronautics and Astronautics
Department of Civil and Environmental Engineering
Department of Communications
Department of Economics
Department of Geography
Department of Industrial Engineering
Department of Political Science
Department of Technical Communications
Department of Urban Design and Planning
Evans School of Public Affairs
Jackson School of International Studies
School of Law
School of Marine Affairs
The Business School

Students completing the GTTL program receive a Graduate Certificate, an appropriate notation on their transcript, and a Letter of Achievement signed by their respective Dean as well as the Dean of the Graduate School. **Exhibit H.f.3** in the Appendix reflects a relatively balanced mix across disciplines of certificate recipients.

The GTTL Graduate Certificate requires the completion of a minimum of 20 course credits (two core courses for 8 credits and four electives for at least 12 credits). Eligible courses in the certificate may also satisfy the requirements of a student's degree program. The core courses—GTTL 501 and 502—review the academic theories,

political-economic structures, industrial dynamics, public policies, strategic issues, and tactical problems.[2] GTTL 501 is offered in the fall and winter quarters. It covers basic concepts of trade, transportation, and logistics, and prepares students for GTTL electives. For this course we have developed cases, innovative simulations, streamed videos and an online course syllabus that provides links to various course materials (explore http://depts.washington.edu/gttl).

GTTL 502 is an interdisciplinary seminar offered in the spring quarter that covers a timely theme on a GTTL topic. Two years ago the GTTL 502 theme was "Security, Economy and Liberty: How Can They Coexist?" Last year the theme was "Reinventing Business, Government and Infrastructure to Embrace Emerging Trade Partnerships with China and Other Asian Countries." GTTL 502 is designed in conjunction with the annual GTTL conference at the conclusion of the spring quarter. In addition to keynote speakers, GTTL 502 student teams prepare and present interdisciplinary research papers on the theme at the conference. We will say more about the core courses in sections that follow.

In accord with its original mission, the GTTL Program has been responsive to the needs of government and industry for trained university graduates. For example, a special Advisory Board drawn from the University and the private and public sectors oversees the GTTL Program. Following public demand and direction from its Advisory Board, GTTL and the UW Extension Program have developed a Global Supply Chain Management Certificate for Extension students. Now in its fourth year, this certificate program requires the successful completion of the two GTTL Core courses plus a one-credit practicum component. The Extension students have mixed quite well with the degree-bound GTTL students in the core courses. Most of the Extension students are professionals working in GTTL-related fields and have contributed significantly to the collective learning experience of the core courses. GTTL is the only program at the UW that mixes Extension and degree students in the same classroom.

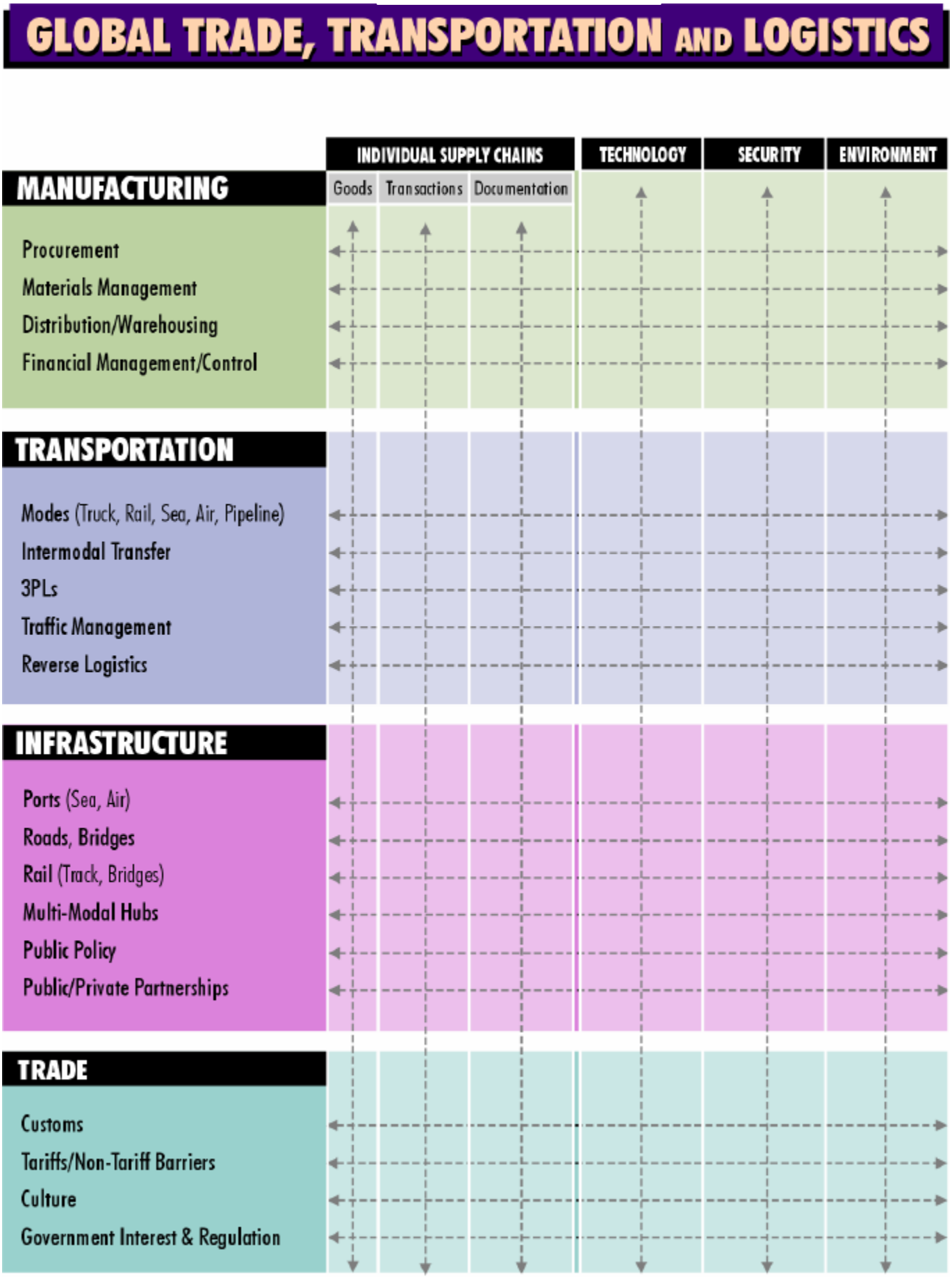
Also in response to the Advisory Board and student demand, GTTL admits a few exemplary undergraduate students each year into its program. While satisfying the same course requirements as graduate students, the undergraduates receive recognition and recommendations from their department heads and GTTL instructors, though not the officially transcripted GTTL Graduate Certificate.

The alumni network GTTL has created, along with the positive feedback and continued demand from professionals who hire its students, illustrate how GTTL continues to fulfill the needs of business and government for students trained in topics related to global commerce.

GTTL's Market and Positioning. In this section we describe important trends in global commerce. In light of these trends, GTTL's approach to interdisciplinary education is well positioned relative to other programs in the U.S.

[2] See syllabi in **Attachment 6**

Figure 1


GLOBAL TRADE, TRANSPORTATION AND LOGISTICS
INDIVIDUAL SUPPLY CHAINS
Goods
Transactions
Documentation
TECHNOLOGY
SECURITY
ENVIRONMENT
MANUFACTURING
Procurement
Materials Management
Distribution/Warehousing
Financial Management/Control
TRANSPORTATION
Modes (Truck, Rail, Sea, Air, Pipeline)
Intermodal Transfer
3PLs
Traffic Management
Reverse Logistics
INFRASTRUCTURE
Ports (Sea, Air)
Roads, Bridges
Rail (Track, Bridges)
Multi-Modal Hubs
Public Policy
Public/Private Partnerships
TRADE
Customs
Tariffs/Non-Tariff Barriers
Culture
Government Interest & Regulation

GTTL Program Coverage: **Figure 1** shows our program coverage in the fields of global trade, transportation and logistics. Along the rows in the figure we show the organizations involved in making and moving commerce. In the columns we show processes that span these organizations. We provide an overview of these topics in our first core course, GTTL 501, and we depend on electives in affiliated disciplines and independent study to offer more detailed coverage.

The top row indicates coverage of the manufacture of goods. We present a manufacturing firm's perspective of its activities from the procurement of supplier materials through materials management in the factory to distribution to customers. We address manufacturing both in operational and financial terms, and we also draw from electives and instructors in the Schools of Business and Industrial Engineering.

Under the headings "Transportation" and "Infrastructure", we consider all modes of transportation, intermodal exchanges, and intermediaries involved in forward as well as reverse logistics. Highway, railroad, bridge and port infrastructures play an important role in effective and efficient transportation. In addition to our coverage of these topics, we benefit from expertise in the departments of Civil and Environmental Engineering and Geography for land transportation and Marine Affairs for sea transportation. Due to the lack of electives in air transportation, GTTL has developed its own course in aviation management.

The bottom row, "Trade," shows various institutions and issues directly involved in effective management, control and regulation of trade with other countries. We rely on the Jackson School of International Studies, the Business School's Marketing and International Business Departments, and the Schools of Law and Public Affairs to supplement our coverage of trade issues.

Corresponding to the first two columns, we address product supply chains that embody the organizations shown along all rows in **Figure 1**. We follow the movement of goods as well as corresponding transactions and documentation. Additionally, organizations within the product supply chains rely on technologies such as computer hardware, computer software, telecommunications and global positioning to effectively and efficiently move the goods. For these topics, we draw from courses and instructors in Industrial Engineering as well as the Departments of Management Science and Marketing in the Business School.

Security has become an important element of post-9/11 commerce activities. Security now spans all organizations shown along the rows in the matrix. Through GTTL's collaboration with Sandia and Pacific Northwest National Laboratories, we have become a leading resource on campus on matters related to security in commerce.

Finally, we are concerned with how commerce affects our environment. We cover environmental topics that range from the transportation of hazardous materials to logistics for disaster relief. We draw from expertise in Civil and Environmental

Engineering, the Evans School of Public Affairs, and The Interdisciplinary Program in Humanitarian Relief to supplement the knowledge base of GTTL on this topic.

Demand for GTTL Skills in Today's Economy: The recent surge of interest in supply chain management suggests the need to view the individual organizations from a total systems perspective. According to the 2002 database of Herbert W. Davis and Company (**Figure 2**), the total cost of logistics in the U.S. was split with 43% attributed to transportation between firms and the remaining 57% associated with material management and warehousing activities within firms. With the recession over the past several years, firms have been able to compensate for sagging sales to some extent by cutting costs throughout their product supply chains. Logistics has become a key area of leverage for firms. The same study indicated that on average, a reduction of each dollar in logistics cost had the same impact on profit as a $12 increase in sales. Consequently, logistic costs were reduced by an average of almost 8% during the year 2002.

Figure 2 also shows that logistics expenditures averaged 7.65% of unit selling price, but this percentage is biased by the large amount of domestic commerce in the United States. When goods move across national borders, this percentage can increase to 25% of unit sales. **Figure 3** shows some of the activities that contribute to these international costs. According to the ARC Advisory Group, "A typical cross-border shipment … changes hands more than ten times, involves completing and filing about 15 documents, interfacing about 25 parties, and being in compliance with over 600 regulations and 500 trade agreements that are constantly changing." [3]

All this complexity suggests opportunities for improvement. Firms are understandably seeking them. Low labor rates afforded by underdeveloped and developing countries contribute to continued outsourcing and offshoring from developed countries such as the U.S. Regardless of a country's stage of development, comparative advantage along with differences in resource and technology suggest that international trade will continue to increase, as will demand for individuals with the skills GTTL offers.

[3] "Linking Supply Chain Security with Sarbanes-Oxley and the Bottom Line," ARC Advisory Group, August 2004.

Figure 2

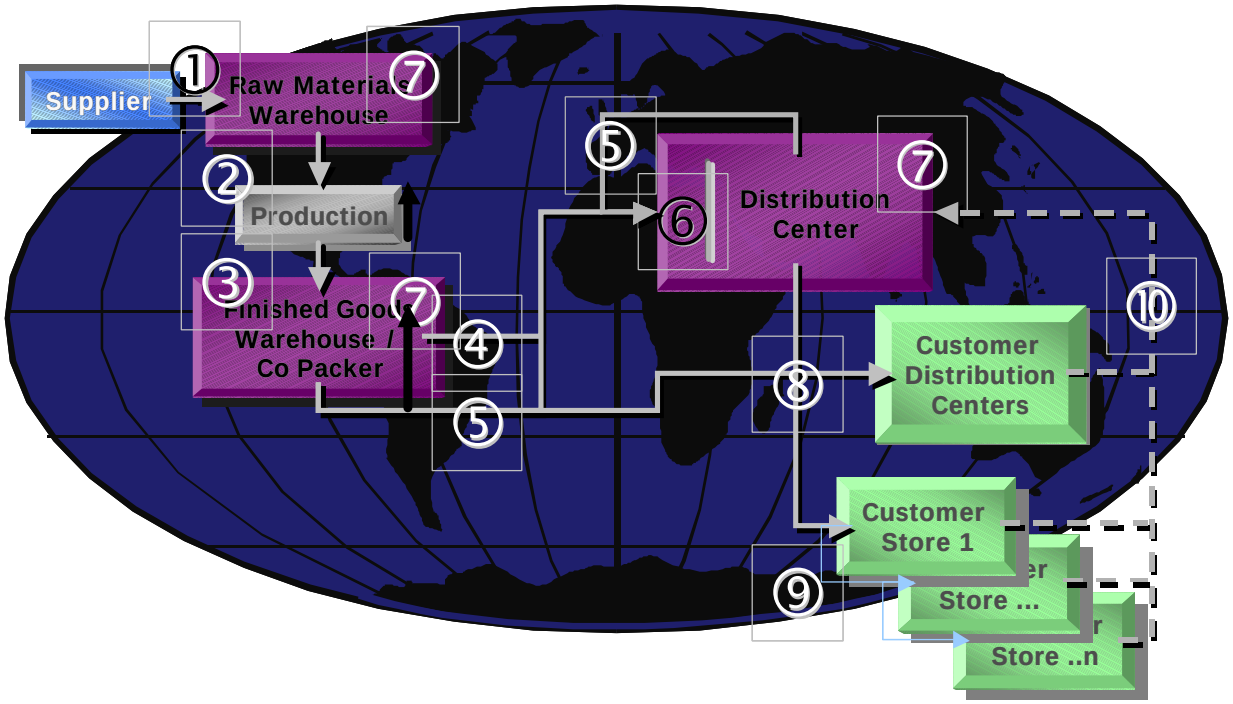
Logistics Costs

Function	% of Total Logistics Cost	% of Sales	% Change since Last Year
Transportation	43%	3.34%	-4.8%
Warehousing	26%	2.02%	-5.6%
Order Entry	5%	0.43%	-12.9%
Administration	5%	0.41%	+3.9%
Inventory Carrying Costs	21%	1.72%	-3.7%
Total Logistics Costs	**100%**	**7.65%**	**-7.9%**

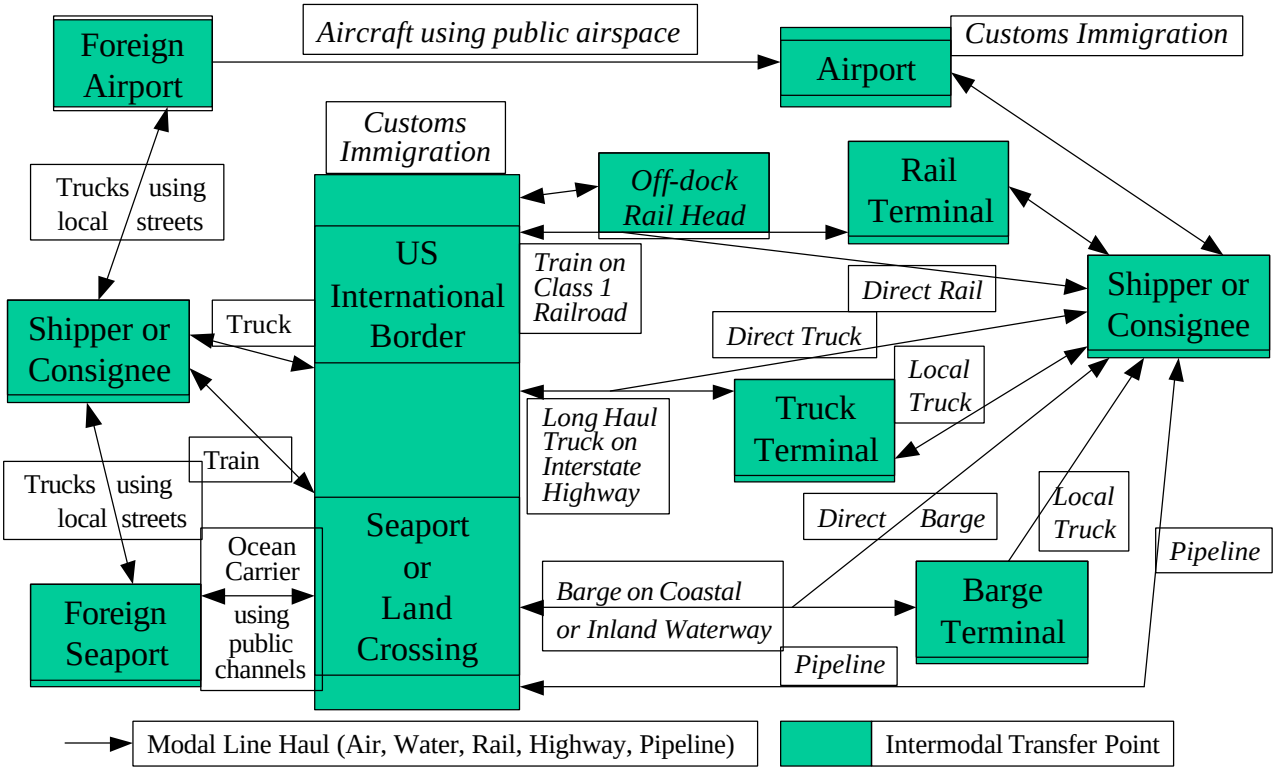
Source: Herbert W. Davis and Company, 2002 Database

Figure 3

Complexity of International Logistics Flows



The International Freight Transportation System



Comparison with other U.S. Programs: GTTL's interdisciplinary program is well positioned to meet ever-expanding needs of business and industry for integrated education in global commerce. In January 2005, the Journal of Commerce reported a summary of 152 college-level programs in the United States that cover various aspects of global trade, transportation and logistics.[4] The study shows, for each, the nature of the education (undergraduate, graduate, professional certification, executive/seminar) along with a paragraph summary of the program. We summarize the details in **Attachment 1**. In GTTL's market space, 62% of the programs provided graduate education, and 34% offered certification. However, only 7% indicated interdisciplinary topical coverage. Besides GTTL, only three schools offered the combination of graduate education, professional certification and interdisciplinary coverage.[5] Furthermore, two of these three programs are housed within schools of business and most likely enjoy the full support and focus of departmental ownership. GTTL's rather unique ability to offer an interdisciplinary graduate certificate, not a departmental degree, suggests that it provides education efficiently with limited dedicated staff and budget.

We conducted a more focused study of 11 well-known programs by inspecting brochure information regarding program descriptions and course coverage (see **Attachment 2**). We observed the following offerings among the 11 programs:

- 90.91% Graduate
- 54.55% Certificate
- 27.27% Interdisciplinary
- 100.00% Logistics /Supply Chain Management
- 45.45% Transportation
- 54.55% Global

We wish to qualify our findings by emphasizing that we did not conduct in-depth studies of these programs beyond what could be gleaned from brochure information. We find it interesting, at least in this cursory investigation, that none indicated a combination of graduate education, professional certification, and interdisciplinary topical coverage. Additionally, program literature of only two of them stressed integrated education over the combined fields of logistics/supply chain management, transportation and global commerce.[6]

As further evidence of the lack of integrated education, Bonney and DeWitt lament in their article (**Attachment 3**) that despite transportation's lions share of logistics costs of today's commerce, few programs demonstrate beyond lip service a commitment

[4] January 24, 2005 issue of the Journal of Commerce (Special Report on Education).
[5] California State University Center for International Trade & Transportation (Long Beach) M.S. and Certificate in Global Logistics & Global Logistics Specialist; University of California, Berkeley-Logistics Certificate available to Masters students in business and engineering; and University of Pennsylvania Wharton School of Business MBA (certificate also offered).
[6] These are: California State University's Center for International Trade and Transportation M.S. in Global Logistics & Global Logistics Specialist, and the University of Denver's Intermodal Transportation Institute.

to transportation education. They claim that few programs offer even one course in the broad field transportation, and this list of programs has been shrinking over the last decade.

All this supports our belief that GTTL is well positioned nationally in the marketplace for graduate education in global commerce. Our coverage appears to be as broad, or broader, than other programs, and our virtual program provides this education efficiently.

Program Strengths. GTTL in its first decade has exhibited a great many strengths. Perhaps the most important of these is a firm commitment to a truly interdisciplinary program of scholars united in the goal of studying global commerce. In our view, we have gone remarkably far in advancing the original and ambitious ideas proposed by the Working Group on Transportation (WGT).

The key to this success lies in the quality of instructors we have assembled. Three have provided core instruction. (Curriculum vitas are in Appedix G.) Tom Schmitt, GTTL Director, teaches both core courses and supervises independent study courses. Greg Shelton, GTTL Assistant Director, teaches GTTL 501, and supervises internships and independent study courses. Jess Browning, GTTL's Director Emeritus, continues to speak in core classes. These three core instructors, together with active scholars in affiliated departments throughout the University, have come together to create an intellectual community and a strong curriculum, dedicated to instruction and research in Global Trade, Transportation and Logistics.

The core and affiliated faculty have degrees in Business, Marine Affairs, Industrial Engineering, Civil and Environmental Engineering, Law, Geography, Urban Planning, and others. Though we may employ different disciplinary methodologies, both quantitative and qualitative, we share the common belief that international commerce promotes the common good, while appreciating diversity of thought, and needs of various socio-economic strata. The interdisciplinary, comparative offerings provide a comprehensive educational experience worthy of a top research university.

Indeed, we aim to provide an intellectually challenging, rich, and unique learning experience. This commitment is evident in many ways: developing innovative core courses, supporting and creating elective courses, maintaining library resources, and providing opportunities for internships, scholarships, and individualized student study with program faculty. We have developed innovative approaches and materials in the core courses (described later in the section on teaching) to provide orientation and facilitate interaction and cooperation among a diverse set of interdisciplinary students, many of whom are working together for the first time.

Affiliated electives also offer rich learning experiences. Most elective courses were quite successful before GTTL became a program and continue to be so now. However, a few critical electives have encountered difficulties. On several such occasions GTTL has funded affiliated elective courses that were deemed essential, and

were not likely to be offered without assistance. For example, it has funded transportation courses in Marine Affairs and Geography. As further evidence of program strength, GTTL launched a graduate course in Aviation and Air Cargo Management at a time when other academic units were either not capable, or not interested in doing so. While GTTL's operating budget does not cover such expenses, we have been able to provide support for these electives with funds generated through the UW Extension's program in Global Supply Chain Management, and by minimizing overhead through such means as streamlining, pooling office resources with other units, and teaching core courses in-house.

Another strength of the GTTL program lies in its library resources. GTTL provides an information clearinghouse for trade, transportation and logistics activities -- identifying key facts and issues about the distribution of goods throughout business supply chains; tracing key transportation patterns of commerce and people; and identifying physical, regulatory and operational limits to trade and transportation in the Northwest. Additionally, GTTL's website provides links to many research papers. GTTL also organizes and coordinates conferences, seminars and workshops on current issues. Beneficial information is disseminated as well via quarterly GTTL newsletters.

Consistent with its mission of fulfilling the needs of business and government with students educated in global commerce, GTTL actively seeks and encourages internships for credit and financial reward. Shelton, Schmitt, and Browning work with leaders in business and government organizations to place students in internships and permanent positions.

GTTL has established an industry-sponsored scholarship fund to encourage exceptional UW students to participate in the GTTL Certificate Program. Since Boeing began contributing five years ago, GTTL has been able to offer a monetary scholarship to each student in the program. Government organizations have also supported GTTL activities with grants for directed research. These agencies, Sandia National Laboratories and Pacific Northwest National Laboratories, requested help and expertise from GTTL on matters of security in commerce.

Other areas of collaboration and support have included: Women's Transportation Seminar scholarships, Pacific Northwest Economic Region and Council of Logistics Management sponsoring students as delegates to their conferences, US Deptartment of Education trade and logistics grant implementation for Ballard High School, grant consultation for Virtual APEC at Northshore School District, *Marine Digest* student paper competition, and Interdisciplinary Program in Humanitarian Relief Certificate advisory board membership, among many others.

Fulfilling the needs of business and government is what we initially envisioned and, in our view, we are meeting this goal successfully. We provide further evidence of program successes in later sections.

We think the GTTL program promotes the fruitful exchange of ideas across disciplines we originally imagined. Our core faculty continually work together to develop innovative materials in the curriculum, and to sustain a program of research on GTTL related topics. As such, the program functions much like a traditional department, despite the absence of a Ph.D. program, an undergraduate program, a school of faculty, and substantial staff support. The GTTL program is relatively new, still evolving, and operates on a very limited budget, which the assessment should recognize. However, we are proud of our accomplishments and do not mind comparison with bigger, more traditional disciplinary units at the University of Washington and other universities.

Limitations and Challenges. Though the GTTL program has been highly successful implementing the WGT vision, there are a number of areas that require more attention and fine-tuning for it to truly realize its potential of serving the greater University community.

Major challenges that all interdisciplinary programs face include keeping an ongoing dialogue with students, sustaining a core of interest within affiliated departments, setting student expectations, generating departmental support and recognition for participating faculty, and funding operations.

Some prospective students do not know about us, but would like to. We have been more successful with some departments than others in maintaining an ongoing dialogue and presence with prospective, current, and graduated students. However, there are no means to compel departments to advise their students about GTTL. Some departments do not let us participate in their student orientation or allow us access to their student bodies, others allow us to participate in fall orientations, but do not follow up; while others do a very good job of cooperating with us and advising their students of the opportunities we provide. Reasons for non-cooperation might include the fact that GTTL electives cost department's student class hours when their students take outside courses. It also might be that departmental advisors are not aware of the benefits interdisciplinary programs offer their students, or do not understand how their programs mesh with GTTL.

Additionally, we have encountered difficulties in sustaining relationships and a core of interest within a few affiliated departments. Dominant background and interests of the faculty drive individual departmental direction in hiring and course offerings. Finding and keeping departmental delegates to GTTL can be problematic as some key units have shifted focus away from GTTL-related topics as a result of retirements, turnover, attrition, and loss of interest. The School of Marine Affairs, for example, has abandoned its Port and Maritime Transportation Management track, and most of the associated courses. Geography, which once offered courses in all modes of transportation, now offers only one overview course per year. The Business School, also once strong in transportation management, now offers no courses in the field. Civil and Environmental Engineering has dropped its series in airport design, construction and management (though they have created a freight transportation course). We have sought to offset these curriculum deficiencies by covering the issues as best we can in our core courses, offering occasional financial and logistical support for elective courses, and

creating elective/special topics courses where sufficient demand is identified (as previously mentioned).

The Graduate School is currently addressing impediments in approaching other units, solidifying old relationships and fostering new ones. Our participation in this process of shared governance and promotion of interdisciplinary collaboration is something we value and are most certainly looking forward to.

In retrospect, GTTL was probably underfunded and understaffed, especially in the face of the aforementioned curriculum attrition and efforts to provide relief. Tom Schmitt has attempted to hold two jobs since he took on the Directorship. He directs GTTL while sustaining teaching, research and service efforts in his home department. Certain leaders within the department have not been particularly supportive or understanding of his GTTL efforts. Their justification is that director compensation (a course break and summer salary support) provides sufficient rewards, and allowances for lessened service activity in the home department would be "double-counting." He will resign as GTTL's Director, effective September 2005, because of this strain of holding two jobs. In keeping with the precedent of support by retired directors, however, he wishes to continue teaching the core courses and serve in a "faculty advisor" role as described in the Strategic Plans section.

As a "virtual department," GTTL must carry out most of the operating procedures and tasks that other academic departments accomplish with a far larger and more specialized staff. Currently, the Assistant Director and Administrative Assistant perform all these tasks at 1.5 FTE between them. The Assistant Director is Professional Staff, Exempt, which means he often puts in long hours on and off campus, for which he receives no additional compensation, especially considering his additional roles as advisor, recruiter, mentor, liaison, and lecturer. The current Administrative Assistant is Classifed Staff and performs duties beyond her initial job specification. However, because she is at the top step of her job class, she is not eligible for a pay increase. (Plans to increase the status and salaries of both positions are outlined in the Strategic Plans section.)

We also wish to acknowledge that positions taken by our Certificate Grantees, their starting salaries, and career progress are important criteria in judging program effectiveness. The University of Washington Alumni Association tracks graduates from degree-granting units, but has no means of gathering information from past participants in the interdisciplinary programs. GTTL would benefit from another half-time staff position (Alumni Coordinator and Internal Communications Liaison) to help keep departmental advisors apprised of its role. This person could also match students with career opportunities that we discover as a result of our extensive networking activities.

B. Teaching

From the start, we imagined a core faculty group and curriculum that was not merely an aggregate of different disciplinary interests, but the product of truly interdisciplinary scholars, research projects, and courses. The core faculty apply a range of quantitative and qualitative methodologies, speak articulately in several disciplinary tongues, and identify with the interdisciplinary field of global trade, transportation and logistics. These threads that connect our activities enable us to offer a radical transformation in graduate education.

It has been particularly challenging for us to effectively deliver the first core course, GTTL 501, with its myriad of topics, to such a diverse set of students. It is their first time together and we have developed innovative approaches and materials to provide orientation and facilitate interaction and cooperation. We have developed exclusively for this course a computer simulation game, "Exotic Extracts," which covers a wide range of business activities. We begin the course by introducing the game. We form teams of students with varied backgrounds. Each team manages a simulated company that makes two products and competes in five markets.[7] Since the teams compete on return on investment, most of the students not majoring in Business Administration must quickly learn accounting principles. We place at least one business student on each team to help his or her peers. We also offer supplemental workshops and study materials to facilitate this training since the course meets only one evening per week. The students are naturally quite competitive, but to add monetary incentives, we award scholarships of $750, $500 and $250, respectively, to the three teams that finish with the highest return on investment..

Midway through GTTL 501, we conduct another educational and enjoyable competitive simulation, "The Bummer Game." The Bummer Game is a physical

[7] Each week student teams assess tradeoffs and make the following decisions:

- Demand Forecasting: Their predictions of finished product demands form the basis for raw material, production and investment decisions. How can historical demand for each type of finished product be used to forecast future demand? How reliable are the resulting demand forecasts?
- Master Scheduling and Distribution Planning: Should their firm produce both finished products this period? What size lot could, and should, be produced? How large should finished good inventories be to cover forecast uncertainty in each market? What form of transportation should be used to ship the products? Products can be delivered by truck during the same week. Rail shipments take another week, but cost about half as much. Is it worthwhile to sacrifice sales in distant markets to compete more effective in ones close by? Customers experiencing lost sales will most likely turn to competition with future business. Is it better to satisfy demands with product shipments in quantities sufficient to satisfy for full vehicle loads or forgo the price discounts to save inventory-carrying cost?
- Procurement: How much of each type of raw material should be ordered and by what form of transportation (rail or truck)? They must consider future finished goods requirements and minimum shipment quantities needed to achieve price breaks.
- Equipment Acquisition: Do they have enough equipment to satisfy their production plans? Should they invest large amounts of time and money in additional machines into four processing centers to satisfy future demand requirements?
- Aggregate Workforce Planning: What are the total direct labor requirements and what might they be in the future? Would it be most economical to increase the work force level, decrease the work force level, or carry idle labor?

simulation intended to illustrate the principles and potential of Lean Thinking. Student teams learn through experimentation how to improve operational and financial performance through real time reporting.[8]

We have also written two cases for GTTL 501 -- *Logistics at Darigold*, and *Port of Tacoma-Hyundai*. Students read and prepare for case discussions led by guest speakers that manage these operations (Mike Bevers, Director of Logistics at Westfarm Foods, and Tim Farrell, Director of the Port of Tacoma, respectively).

The 501 course materials also include books, articles and three streamed videos that we have produced and make available online. Most of the assignments, supplemental articles and required articles are accessible via the course online schedule http://depts.washington.edu/gttl/academics.html. We also arrange as part of the course tours of the Ports of Seattle and Tacoma so students can experience firsthand the Ports' capabilities and challenges.

Success in the course may be measured in many ways. The course ratings have been solid (**Exhibit H.g.1** in the Appendix). Another acid test is the sustained and growing demand for the course. For example, we had to turn away 15 students on the first day of fall quarter 2004 because the classroom allows only 47 students.

The second core course, GTTL 502, is an interdisciplinary seminar offered in the spring quarter that covers a timely theme on a GTTL topic. We offered seminars on security in commerce when few knew much about the subject, but were anxious to learn. Three years ago the GTTL 502 theme was "Commerce Security Issues and Trade Impacts in the Context of the September 11, 2001 Terrorist Attacks." We followed up two years ago with the theme "Security, Economy and Liberty: How Can They Coexist?" Last year we tackled the issue of outsourcing with the theme "Reinventing Business, Government and Infrastructure to Embrace Emerging Trade Partnerships with China and Other Asian Countries." The theme this year is "Managing Constraints in Making and Moving Goods Domestically and Internationally." 502 is designed in conjunction with the annual GTTL conference held at the conclusion of spring quarter. In addition to keynote speakers, student teams prepare and present interdisciplinary research papers on the theme at the conference. Demand for GTTL 502 has been strong and the course ratings exemplary (**Exhibit H.g.1** in the Appendix).

[8] The Bummer Game received 2nd place in the Decision Science Institute's International Instructional Award in 1997. We emphasize the following lessons: 1) benefits of reducing non-value added activities in a supply chain, 2) importance of identifying and breaking bottlenecks, 3) benefits of co-location of physical and information processes, 4) potential benefits (and drawbacks) of reducing batch sizes and interstage buffers, 5) application of different types of pull systems, 6) benefits of cross-training, 7) benefits and drawbacks of specializing tasks, 8) assembly-line balancing concepts including takt time and cycle time, 9) value of flow-time as a surrogate for profit, 10) benefits and drawbacks of outsourcing overseas, and 11) value of effective team planning under deadline pressure. For more details, see **Attachment 7**, "Red Bummer Dudes, Blue Bummer Dudes" in *Business* (a University of Washington Business School publication).

Success also lies in the quality of the affiliated electives. Many of the elective courses have been quite successful, including the Geographic Information Systems series from Geography, International Business courses, and transportation systems and planning courses from Civil and Environmental Engineering, to name a few. The entire set of electives, listed in frequency of usage, is shown in **Attachment 4**. **Attachment 5** illustrates the courses taken in fulfillment of GTTL certificate requirements by a small sample of students in various disciplines.

As might be expected, a few critical electives have encountered difficulties. On occasion, GTTL has funded affiliated elective courses that it deemed essential, but not likely to be offered without assistance. As mentioned earlier, GTTL has contributed funds to other departments to help them offer GTTL electives (e.g. SMA 516, Seaport Management, and GEOG 448, Geography of Transportation). Additionally, GTTL launched a graduate course in air transportation, an important domestic and international mode of transportation. We found three retired executives who were interested in teaching this course in Aviation and Air Cargo Management -- Ray Waldmann, former Vice President of Governmental Affairs at Boeing; Barrie Austin, former Chief Engineer at Boeing; and Chris Fidler, former Vice President of Governmental Affairs at Airborne Express. They have done a superb job of developing and delivering the course, which includes a quarter-long computer simulation game where teams of students run competing airlines.[9] The course ratings have been stellar (**Exhibit H.g.1** in the Appendix) and the demand for the course steadily growing. Enrollment in the course most recently offered this winter has grown to 21 students.

As mentioned before, GTTL's informational resources continue to contribute greatly to its teaching and outreach efforts. Although the campus library system is quite varied and extensive, there is a dearth of materials on the subject of global trade, transportation and logistics. GTTL's information clearinghouse of books, periodicals and academic journals: identify key facts and issues about the distribution of goods throughout business supply chains; trace key transportation patterns of commerce and people; and identify physical, regulatory and operational limits to trade and transportation in the region. Additionally, GTTL's website provides links to many research papers, which individual students and student teams have prepared as part of the two core courses. GTTL organizes and coordinates conferences, seminars and workshops on current issues, in addition to disseminating information in its quarterly newsletter.

To supplement instruction, GTTL actively seeks internships for credit and financial reward. Examples include the Ports of Tacoma and Seattle, Brooks Sports, Pinkerton Security Services, Viatru, and Washington State Department of Transportation, to name a few. GTTL instructors actively participate in local, regional and national projects, as well as professional and community societies.[10]

[9] The Open Skies simulation model was generously offered for our use by Mr. Mike Hirst, Professor Emeritus, Loughborough University, UK. Students choose all the operating parameters of their virtual airline: planes and their configuration, routes, frequency of service and seat pricing.

[10] GTTL has representatives that serve in the following professional societies: APEC (as U.S. delegate to the Port Experts Group and U.S. Co-Chair of the Human Resource Group), the Transportation Sector of the Russian-American Pacific Partnership, the Women's Transportation Seminar (WTS) Puget Sound Chapter,

GTTL's industry-sponsored scholarship fund encourages exceptional UW students to participate in the GTTL Certificate Program. The Boeing Company has expressed its appreciation of the GTTL Program by donating $10,000 to the GTTL Scholarship Fund every year for the past five years. Since Boeing began contributing, GTTL has been able to offer a monetary scholarship to each GTTL student.

Government agencies have also supported GTTL activities with grants for directed research. During the academic year of 2002, Tom Schmitt and three GTTL students were funded by NISAC, a collaborative effort between Sandia National Laboratories and Los Alamos National Laboratories. This was to help NISAC build a large-scale simulation model of over 14,000 northwestern manufacturing firms and their supply chains. GTTL's role in the project was to characterize manufacturing and transportation behavior of these firms. This included case studies of Northwest electronics firms and their supply chains, analysis of databases, review of supply chain literature, and development of simulation models. NISAC's overall modeling effort contributes to the nation's ability to prepare for possible attacks on critical infrastructure such as electric power, telecommunications, and transportation, and to improve the effectiveness and efficiency of responses should such attacks occur.

During the 2003 academic year, Tom Schmitt and twelve GTTL students were supported by Pacific Northwest National Laboratories (PNNL) to help in defining transparent non-proliferation export controls for China, Singapore, Thailand, Malaysia and Indonesia. GTTL assessed the trading relationships to provide better understanding of the flow of commerce among these Southeast Asian countries and their partners. PNNL's mission was to identify potential and real roadblocks to trade and the trading routes in Asia as well as, potential vulnerabilities in these trading relationships that could facilitate nuclear proliferation.

Other areas of collaboration and incentives in teaching include: Women's Transportation Seminar scholarships, PNWER and CLM sponsoring students as delegates to their conferences, US Department of Education trade and logistics grant for Ballard High School, grant consultation for Virtual APEC at Northshore School District, *Marine Digest* student paper competition, and the Evans School of Public Affairs/Marc Lindenberg Center Humanitarian Relief Certificate advisory board membership, among many others.

Council of Logistic Managers (CLM), and Pacific Northwest Region Economic Region (PNWER). Please refer to the GTTL Web Page Links (see Website) for the myriad of business and government organizations involved in global commerce that are affected by and influence Northwest commerce issues. Examples include: CLM, SOLE, APICS, PMA, U.S. & Washington DOTs, Ports of Seattle, Tacoma & Olympia, Washington State Office of Trade & Economic Development (CTED & OTED), Washington Council on International Trade (WCIT), Puget Sound Regional Council, Trade Development Alliance of Greater Seattle, Propeller Club, Transportation Club, Transportation Research Board, Cascadia Institute, Freight Mobility Roundtable, U.S. Army & Coast Guard, APEC, NAFTA and WTO.

C. Research

We view the primary mission of GTTL as teaching and service, although we are active in research on topics related to making and moving commerce. In the previous section on teaching, we summarized research by selected GTTL students under the supervision of Tom Schmitt, Sandia National Laboratories, and Pacific Northwest National Laboratories. Additionally, one of our outstanding undergraduate students from the Department of Geography published an article on maritime security in *Marine Digest* as a result of a paper competition sponsored by the industry.[11]

Tom Schmitt and Jess Browning of GTTL's core faculty have been active in research. Their respective areas of expertise (manufacturing and supply chain management, and international trade and transportation) complement one another in covering the broad field of global trade, transportation and logistics. As indications of relevance and complementarity, we provide abstracts of recent publications below:

Recent Publications by Tom Schmitt.

"Conveying Cross-Functional New Product Development Concepts: The Payloads 9.8 Mars Lander Exercise" (with Carl Obermiller and Karen Brown), *Decision Sciences: Journal of Innovative Education*, forthcoming, 2005.

We describe a hands-on exercise for teaching significant product development concepts. At the heart of the Payloads exercise is a team assignment to create packages that protect chicken and quail eggs from breaking when dropped from a significant height of 50 ft. It is based on 'egg drop' creativity exercises, but goes beyond with a set of performance criteria that reflect cross-functional teaming, and profit elements driven by product performance criteria, time-to-market effects, and part commonality incentives. We have run this exercise more than 70 times with over 2,000 students in operations management, project management, and marketing management courses, as well as in executive seminars. It has proven to be quite robust, effective and fun. The exercise gets everyone involved, and when people are having fun they are more likely to remember what they did and what they learned. Students gain insights into key social and technical aspects of new product design and development.

"Scheduling Recurrent Construction" (with Bruce Faaland), *Naval Research Logistics*, forthcoming, 2005.

A problem we call recurrent construction involves manufacturing large, complex, expensive products such as airplanes, houses and ships. Customers order configurations of these products well in advance of due dates for delivery. Early delivery may not be permitted. How should the manufacturer determine when to purchase and release materials before fabrication, assembly and delivery? Major material expenses, significant penalties for deliveries beyond due dates, and long product makespans in recurrent

[11] Roberts, Tyler D. "Rethinking Boundaries: Assessing the Dynamic Nature of Our Borders," *Marine Digest and Cargo Business News*. V.81 No.7. March 2003

construction motivate choosing a schedule that maximizes the net present value of cash flows. Our heuristic first projects an initial schedule that dispatches worker teams to tasks for the backlogged products, and then solves a series of maximal closure problems to find material release times that maximize NPV. This method compares favorably with other well known work release heuristics in solution quality for large problems over a wide range of operating conditions. Computation times exhibit near linear growth in problem size.

"Economic Lot Scheduling with Lost Sales and Setup Times" (with T. Arreola-Risa and Bruce Faaland), *IIE Transactions on Scheduling and Logistics*, Volume 36, Number 7, 2004.

We develop an economic lot scheduling model that permits lost sales if they lead to higher profits. Instead of charging a fixed amount for setups irrespective of order size, the model ensures that the time to set up and produce a batch quantity of an item cannot exceed available machine time. Inventory carrying cost becomes a nonlinear, rather than linear, function of the production quantities in cases where demand is not fully satisfied. It may indeed be optimal to satisfy partial demand rather than all or none. Although the problem becomes more difficult to solve when we drop the requirement that all demand be satisfied, we are nevertheless able to solve problems involving as many as 1000 products. This is made somewhat easier because of a structural property of optimal solutions: the facility should never be idle. In our experiments computation grew according to the square of the number of products.

"QUADRANT Corporation Applies Lean/JIT Concepts in a Project Environment" (with Karen Brown and Richard Schonberger), *Interfaces*, vol. 34, no. 6, 2004.

Quadrant, a subsidiary of Fortune 500 Weyerhaeuser Corporation, provides transferable lessons for applying lean manufacturing concepts in project environments. The company has experienced impressive market and financial results, using an even-flow, predictable scheduling model in which it starts six houses per day and finishes each one in exactly 54 days. Quadrant follows recognized lean principles, including designing its value stream around customer needs, balancing work so all stages flow evenly, operating on the basis of customer pull, and continuously improving. Special features of the system that enable Quadrant to effectively implement lean operations in a project environment include: 1) knowing what can be standardized and what must be customized, 2) carefully setting and consistently managing customer expectations, 3) aligning goals of all stakeholders in the supply chain, and 4) recognizing that there will be variances, and designing routines to handle them when they do occur.

"Your Lean Team: Use it, or Lose it" (with Karen Brown and Richard Schonberger) *Target*, Volume 19, Number 1, 2003.

Virtually all companies want to grow. Growth may involve acquisitions, or expansion largely at existing sites. With growth, however, human assets are often under-appreciated, misused, and lost for what seem to be sound reasons. Acquiring a high performing business unit or elevating productivity at an existing one can lead to redundancies and over-capacity: excess facilities with similar capabilities, overlaps in R&D activity, and more floor space and people than necessary for meeting current market needs. These circumstances often spur decisions to shutter some facilities. As part of this cycle, well performing sites can become victims of supply chain consolidation, their knowledge bases cast aside in the interest of system efficiencies. They illustrate these practices with three cases. Boston Scientific's closure of the Northwest Technology Center in Redmond Washington is one of them, and it exemplifies a lost opportunity for leveraging human capital.

The proposed strategy involves effectively migrating the company's foremost intellectual assets—resident at a home base or a satellite unit—to other existing or acquired units. The strategy is characterized by a repeating, long-range cycle starting with products or product variations, simplifying and improving their manufacture, standardizing and documenting processes for volume production, and migrating expertise to newly established production centers in globally attractive locales.

Recent Publications by Jess Browning.

"Short Sea Shipping and Innovations for Intermodal Container Logistics in Northeast Asia" (with Seung-Hee Lee) *Journal of Logistics and International Trade,* Volume 1, No. 2, 2004.

The Incheon Region has numerous assets that fall within a Pentaport model. These include the Incheon International Airport, the Port of Incheon, a coastal industrial park, free economic zones, a leisure port, and Songdo New Town designed to be the future Silicon Valley of Korea. This paper looks at how Northeast Asian trade between China and Korea might be enhanced by application of the Pentaport model in making the Incheon region a North East Asian Hub. It looks also at their trade and logistics systems as well as their waterborne commerce. It proposes an integrated transportation system for the Yellow Sea Region that would be beneficial to the economies of the Northeast Asia. It also stresses that innovative technologies for ships, terminals and cargo handling systems should be introduced to develop a competitive short sea shipping system in the region. Cooperation among the regional countries will be essential to achieve the final goal. The potential of methods of container shipping is discussed as it might apply to short sea shipping in the Yellow Sea Region, which could greatly facilitate Incheon's situation with respect to the broader region in application of the Pentaport model.

"Logistics of Container Transport in the Yangtze & Yellow Sea Regions" *Journal of Logistics and International Trade,* Volume 1, No. 1, December 2003.

In the 21st Century, a region's growth and prosperity will depend upon its intermodal transportation infrastructure and its ability to efficiently move goods, materials, and people within the system, whether it be from origin to destination, from supplier to customer through the various levels of the supply chain, or from point to point within the system. Planning for the future focuses on improving a region's intermodal transportation system efficiencies and infrastructure, its connection to other economies, and the development of logistics institutions and facilities.

With China's rapidly developing economy and society, record numbers of new modern facilities such as airports, ports, highways, logistics parks and warehouses are being built. Along with this, companies have made extensive investments in information technologies and software to support the tremendous growth that has taken place in the logistics industry. The development and improvement of China's historic inland water transport system is essential to their continued future growth and prosperity. In Korea, past and present National Governments have emphasized the importance of developing a North East Asian Logistics and Business Hub in their region and have worked on strategies, which include water transport, as part of an important national agenda to that end.

This article looks at how trade flows in the Yangtze and Yellow Sea Regions and between China and South Korea might be enhanced by application of improved shipping methods in marine commerce that will promote economic growth in the region. The application of logistics practices and use of barges are explored for the movement of containers on inland and coastal waterways as well as in short sea shipping, which could greatly facilitate economic growth within the region..

"Development of Logistics and Transportation Systems in Promoting Trade & Economic Growth: Comparing Incheon and Seattle Areas" *The Institute of Korean Studies*, published in the Korean Obsever, Vol 34, No.3, Autumn 2003.

Incheon, Korea is an economic center that has the potential to be the hub of Northeast Asia. It has numerous trade, transportation, and logistics assets that include the Incheon International Airport, the Port of Incheon, a coastal industrial park, a customs free zone, logistics facilities, and Songdo, designed to be the future center for international business and knowledge based industries. Along with this, the region has the academic talent and the educational infrastructure to become a center of higher education and research with institutions such as Inha University and others.

The Seattle area is well known for its international airport, SeaTac, and its seaports in Seattle and Tacoma; the logistics facilities in the Kent/Auburn Valley; and the higher education and research facilities, notably, the University of Washington. The area's leaders know that the Seattle region's growth and prosperity in the 21st Century will depend upon its intermodal transportation infrastructure and operations within the system.

Economic theory states that improved transportation systems along with a cluster of business, education, research, leisure and other socio/techno-economic activities can facilitate increased trade and economic growth within a given region. This article brings a global perspective to regional thinking as well as a conceptual framework to explore what each of these two regions are doing to create, expand, and improve socio/techno-economic facilities as well as integrate their intermodal transportation systems in order to create a regional hub that encompasses the pentaport model.

D. Relations with Other Units: The Institutional Challenge of Interdisciplinarity

Since its inception, GTTL has had a history of collaboration with other units, both on the UW campus and at other institutions. At the University of Washington, we have collaborated with other departments on a number of projects and presentations, including, but not limited to:

- The Jackson School of International Studies-Middle East Transportation Conference (2000),
- Amulti-unit joint class on China and the WTO (1999),
- Several joint student research presentations with the Business School (1999-2001),
- Collaboration with the School of Marine Affairs on the Maritime Transportation Initiative, Pentaport Conference, et al.,
- The Global Business Center on student consulting projects for Expeditors International,
- Department of Economics' on-line collaboration project with City University of Hong Kong,
- Evans School of Public Affairs' Marc Lindenberg Center on creation of the Intedisciplinary Humanitarian Relief Logistics Certificate Program,
- Program on the Environment informational presentation at Seattle Maritime Festival.

Greg Shelton and Tom Schmitt have also served as thesis committee members for interdisciplinary students.

This list could go on, but serves to illustrate the degree of interaction GTTL has with units on campus. It should be noted that informally, and on an ad-hoc basis, students from all over campus receive advising both about the GTTL program from some of their advisors, and from GTTL about classes and opportunities that exist in affiliated departments.

Off campus endeavors include collaboration with a number of academic, commercial, policy, and research institutions. Dr. Jess Browning remains an active participant in several sectors of Asia-Pacific Economic Cooperation (APEC), the Transportation Research Board, the Puget Sound Regional Council, the Transportation Club of Seattle, and is a key University of Washington/GTTL delegate to the newly-

formed Global U-7 consortium. His affiliation with these and other institutions creates opportunities for student education and research. GTTL represents the University of Washington at Pacific Northwest Economic Region (PNWER) meetings and conferences, allowing for the interaction and collaboration of our students with universities and agencies on both sides of the Canada-US border. Greg Shelton is active in the local chapter of the Canada-America Society and the Association of Canadian Studies in the US (ACSUS), offering further opportunities for our students to collaborate with their peers in member institutions such as the University of British Columbia, Simon Fraser University, Gonzaga University and Seattle University. Tom Schmitt serves on the advisory board of the newly-formed local chapter of the Council of Supply Chain Management Professionals (CSCMP).

GTTL membership in the Washington Council on International Trade offers a venue for students to network in the international trade community, as does membership in the Transportation Club of Seattle, the Propeller Club of Seattle, The International Air Cargo Association, Women's Transportation Seminar, World Affairs Council, Council of Supply Chain Management Professionals, and the Trade Alliance of Seattle. Several of the organizations have presented scholarships and prizes to our students for academic achievement. The Ports of Seattle and Tacoma have been very generous in offering support to GTTL, through internships for our students, tours of their facilities, sponsorship of our personnel for meetings and conferences, and serving as "virtual faculty" through pro-bono lecture and presentations in our class. For example, Tim Farrell, Executive Director, Port of Tacoma, regularly makes the trip to Seattle to offer his insights to our classes.

As previously mentioned, Tom Schmitt has led research efforts with Sandia and Pacific Northwest National Laboratories involving active student participation in matters of international trade security, infrastructure interdependency, and the effects of trade flow disruptions.

These ties to other units, both on and off-campus, provide assistance in recruiting graduate and Extension students to the program. Faculty in our affiliated departments help spread the word about GTTL, and the relationships we have with these departments help to ensure that we participate in departmental orientations to inform students about the interdisciplinary opportunities in GTTL. We have permanently cross-listed our core courses with the Business School, which gives us a steady flow of business students in the program. Off-campus networking helps us to inform and recruit potential Extension students as well.

Our graduate education is improved by all these relationships, primarily through the students' exposure to the differing schools of thought of the various disciplines that are intermingled in our classes. We form interdisciplinary teams of students to address research problems, with the outcome being very thorough, balanced, and informed research. Professionals in government and industry often seek our students' research. This interdisciplinary mix is augmented by the practitioners and professionals who become part of our classes through UW Extension. These relationships with our affiliate

departments and organizations are truly the core essence of our successful interdisciplinary program.

Our relationships with contributing units and organizations are maintained through the individual efforts of our staff by networking, inclusion in plenary meetings, conducting joint courses whenever possible, and offering students means by which to enhance their educational experience.

E. Diversity

GTTL is committed to seeing global commerce through the eyes of variously situated populations, including those who are disadvantaged by current relations or crises, who often look to economic institutions for relief, transformation, and opportunity. This commitment is most notable in the mix of gender, race, class, and other lines of distinction of GTTL students as well as instructors and speakers in the program. It has successfully mixed graduate students, upper-level undergraduates, and Extension students from various disciplines and backgrounds, e.g., Humphrey Fellows, international students, and students from at least 16 different academic units across campus. The current class (Winter Quarter 2005) offers a glimpse at a typical mix of GTTL students. Of the fifteen students, seven are international students from at least five different countries. Also in the class are four women, two of them minorities. The class is embodied by at least nine different academic disciplines.

Many students seek GTTL because of its allegiance to the study of difference, variation, and contrast in trade and commerce in underdeveloped, developing and developed countries. The comparative cross-national and global emphasis likewise promotes a conception of citizenship attuned to the increasing interdependencies of diversely situated peoples in the world. This has enabled us to bring our students a fabulous new educational experience, to connect intellectually with many diverse endeavors on our campus, and to mark a unique presence in the academic world of global trade, transportation and logistics.

Though GTTL does not target or recruit specific demographic or ethnic groups, we strive to provide our students every opportunity for scholarships, internships, networking opportunities, and access to academic resources, regardless of students' individual backgrounds. We are involved in the advancement of women and disadvantaged business entities in the transportation field through Greg Shelton's continued service as Student Liaison on the Board of Directors of the Women's Transportation Seminar, Puget Sound Chapter. This organization of transportation professionals offers mentoring, scholarships, networking, and internships to a broad base of students. Several of the scholarships are exclusively for female students in the transportation professions. This is not the only example -- all of the professional organizations and associations with which GTTL is affiliated promote equal opportunity with no bias based upon gender, ethnicity, etc.

F. Certificate Program Effectiveness

Section A and Appendix H provide compelling support that GTTL's interdisciplinary program is well positioned to meet ever-expanding needs of business and industry for integrated education in global commerce. Close collaboration with industry and government enables us to ensure that students are learning the professional skills relevant to the field, and can find meaningful internships and employment within these organizations. Insights from practitioners and industry are constantly folded into the curriculum as a means of ensuring that the GTTL program remains viable and effective. This reflects favorably on the Graduate School, the University, and the region, as the quality of our students contributes greatly to the local and global economies.

As we have mentioned, other quantitative evidence to measure the success of our graduates has been difficult to gather due to the relatively small number of subjects and low response rates to surveys we have generated. Anecdotal and qualitative evidence has been generated from conversations with, and testimonials from, alumni, industry leaders, and government officials at various events such as conferences, symposia and seminars. A strong indicator of external support is that industry has provided financial support to ensure scholarships for every GTTL student. Other standards we use to measure success in achieving certificate program objectives include: the increase in students enrolled (Appendix H.f), the steady number of certificates we bestow annually (Appendix H.f), and excellent course ratings (Appendix H.g). This leads us to believe that we are meeting our objectives as stated in Appendix F. Any factors that may impede our ability to meet objectives as well as plans for overcoming these impediments are discussed in the Challenges section in part A.

G. Graduate Student Services

Much of the information on our recruitment/outreach programs to attract graduate students has been outlined in the Challenges and Relationships sections. Given the small staff and resource size of GTTL, we are very dependent on word-of-mouth among our students, and on help from the faculty and advisors of collaborating units. Whenever allowed, we address departmental orientations, courses and lectures, and other events that give us exposure to potential recruits. We strive to ensure that the program continues to offer interesting, relevant, and valuable information and skills to a wide variety of students

Much of the success of our recruitment efforts is a function of the interests of the incoming students to our component departments. We can see enrollment from these respective units varying over time, often in direct correlation to the current curriculum and recruitment foci of these units (see Challenges section regarding the attrition of relevant electives).

Though we have no formal tool for assessing attrition and retention rates, we show enrollment and certificate numbers in Appendix H (see **Exhibits H.f.1- H.f.3** for GTTL Program Enrollment, Completion Rates and Departmental Mix). Many students have indicated they did not learn of the GTTL option until they were so close to graduation that there was not time to complete the program. Availability and timeliness of appropriate elective courses have been other ongoing problems with certificate completion rates. Some of the more popular electives are now only offered every two years, or during summer quarter when many students cannot take them.[12]

One of the steps we have taken to minimize attrition is the establishment of GTTL Independent Study and Internship courses, which can allow students to fulfill their elective requirements toward the Certificate. We have encountered one problem in this area, however, in that not all units are willing to count Independent Study toward completion of the students' degrees. This makes students hesitant to pursue this option.

We have also created elective courses, such as Global Aviation Management, which can help students who are seeking courses relevant to Certificate completion.

Other steps taken to minimize attrition lie in our efforts toward Advising, Mentoring and Professional Development. Our Certificate Program enrollment is small enough that an ad hoc, personal approach can be taken with each student. We strive to ensure that students are aware of the courses and opportunities available to help them complete their Certificates, and that they have ample opportunities to become connected to the academic and professional communities that are constituent of the GTTL Program (as mentioned in the Relations with Other Units section).

We communicate academic program expectations to students through our promotional/informational sessions, literature that we distribute through the students' home departments, individual transcript evaluations, and individual counseling. During the latter two, we outline each student's timeline and coursework, as well as phases and benchmarks of their individual progress toward Certificate completion. Their examination and presentation requirements and standards of scholarly integrity are generally addressed during the GTTL Core classes, and specifically discussed one-on-one. We try to address students' questions and concerns as they arise, often corresponding by email or telephoning during evenings or weekends. We want the students to know that we care about their needs and are available to lend whatever help we can.

We inform students of GTTL's graduation and placement record usually in individual counseling sessions, and at orientation seminars. Information such as time to Certificate completion, average completion rates, and employment of graduates two and

[12] The MBA Program is a special case regarding completion rates. A low completion rate of MBA candidates (12%) relates directly to the curriculum rigors of the MBA program MBA Candidates have a limited number of out-of-department electives they are allowed to pursue. Also, their entire first year is programmed, which does not allow them to pursue courses beyond their core during that year.

five years after degree completion are again addressed individually, and with the help of interested GTTL alumni.[13]

As for the GTTL mentoring/advising plan, each student's work and progress toward the Certificate are evaluated on an annual basis (during winter and spring quarters) and the results of the evaluation are communicated to the student. Most students who intend to complete the certificate have evaluations more often to ensure that they are on track.

Regarding GTTL's professional development plan, questions such as: "What are the career opportunities for a graduate certificate recipient in your field?", and "What skills/experiences contribute to success in the various career paths listed above?" are addressed either in our ad hoc counseling sessions, through the networking opportunities we provide, or through the professional practitioners whom we invite as guest lecturers. GTTL is such a small unit that the implementation of a formal guidance and development program is simply not practical under the current structure.

We actively encourage our students to voice their opinions and desires in an effort to minimize the need for a formal grievance process. This allows the students the feeling of having a hand in governance of GTTL. As for grievances that have been lodged over the past 3 years, none have been formal. The occasional unfavorable individual course evaluation is as close as we have come to negative feedback. This rarely occurs; when it does, we try to rectify the situation as best we can while recognizing the fact that we cannot always please everyone, especially in an interdisciplinary environment where students' expectations are often as diverse as the students themselves.

H. Strategic Plans

GTTL has been committed to sustaining faculty investment in teaching and service. With our small program size, internal governance has been limited primarily to our graduate curriculum and to intellectual projects such as speaker series, and conferences. The founding director, Jess Browning, led virtually all matters of organization, teaching, and service during GTTL's initial two years, involving others as needed. Greg Shelton came on board in 1997 as temporary hourly office staff, and was hired permanently as Program Operations Coordinator in 1998. With Professor Browning's retirement in 2000, Tom Schmitt became the Director, Greg Shelton assumed a new role of Assistant Director, and Nicole Feodorov was hired as a half-time Administrative Assistant. At this time of GTTL's first program review, we anticipate another organizational transition and program reinvention.

[13] This would be much more effective if we had a broader network of alumni, but they are a small group that disperses rapidly upon graduation, and tends to stay in touch with the home departments. See Challenges and Limitations section.

Transition Plans. Tom Schmitt will soon announce his retirement as GTTL's Director, effective September 2005. We propose the following organizational and leadership changes to sustain and improve GTTL Program quality.

We propose that Greg Shelton assume the role of Director of the Program. Greg has effectively overseen the program's administration since he joined the GTTL staff in 1997. During this period, he has successfully implemented strategic initiatives such as establishing the Global Supply Chain Management Extension Certificate, which melds a select group of Extension students with graduate students in the GTTL Program. He has established several GTTL courses: GTTL 599, Special Topics; GTTL 600, Independent Study; and GTTL601, GTTL Internship. Another major initiative implementation was the establishment of the Global Aviation Management course, a unique GTTL elective that had not been offered on campus before. He teaches GTTL 501 in winter quarter, in addition to coordinating and supervising Master's theses, internships, and independent study projects. He also shares local, regional, national, and international outreach responsibilities with Tom Schmitt and Jess Browning.

Following Jess Browning's precedent of continued support by Directors Emeriti, we propose that Tom Schmitt continue to support GTTL in a new faculty advisor role. He hopes to: teach the two GTTL core courses (GTTL 501 and 502), chair GTTL's Advisory Board, supervise students' master's theses, sponsor independent study, and provide student mentoring. Additionally, his Ph.D. and faculty position in the Graduate School enables him to formally chair theses and supervise graduate activities crucial to the functioning of the program.

Nicole Feodorov has steadily been increasing her expertise and abilities to be able to perform the role of Program Coordinator. This now includes grant proposal preparation, seminar/conference coordination and planning, class scheduling, marketing and information dissemination (including newsletters and website maintenance), and personnel management. Given her broadened array of duties and responsibilities, we hope to be able to raise her position to Professional Staff and grant her the title of Program Operations Coordinator (50% FTE).

GTTL would also benefit from another half-time staff person to serve as Alumni Coordinator and Internal Communications Liaison. This person would keep departmental affiliates apprised of GTTL activities, and perform new activities that we believe critical to the continued growth and success of the GTTL Program. We recognize that post-graduation jobs, starting salaries, and career progress are often cited as important criteria in judging program effectiveness. There is a critical need for someone to match students with career opportunities that we "discover" as a result of the extensive networking activities by Greg Shelton, Tom Schmitt and Jess Browning. Someone also needs to track the progress of GTTL certificate recipients, given that the UW Alumni Association does not keep track of academic certificate recipients. Computer system development, networking and follow-up activities are essential to develop a job base for GTTL graduates and tap outside funding opportunities.

Interdisciplinary Elective Coordination. The long-term, ongoing net loss of transportation and trade-oriented classes across campus continues to place pressure on GTTL to ensure that sufficient electives exist to fully round out the educational experience of its students. We have mentioned this previously. The attitude of at least some of the units is that "GTTL can cover the topic", or "This is closer to the scope of GTTL, therefore we don't need to offer the subject". Though GTTL has helped to fund elective courses in the past, this is not within the GTTL mandate, nor is it fiscally sustainable under the current budgetary situation. We would like to propose an interdisciplinary reassessment and reevaluation of the GTTL elective course inventory campus-wide. This would allow us to engage in a dialogue as to what is being addressed, what should be addressed, and what steps we can take to ensure that the UW curriculum not only offers the necessary courses (funded equitably), but remains parallel to peer institutions and competitive in the market.

Budgeting. We have provided a breakdown of GTTL's uses of the operating funds for the 2003-2005 Biennium in **Figure 4**, and its uses of Extension funds in **Figure 5**.

Figure 4

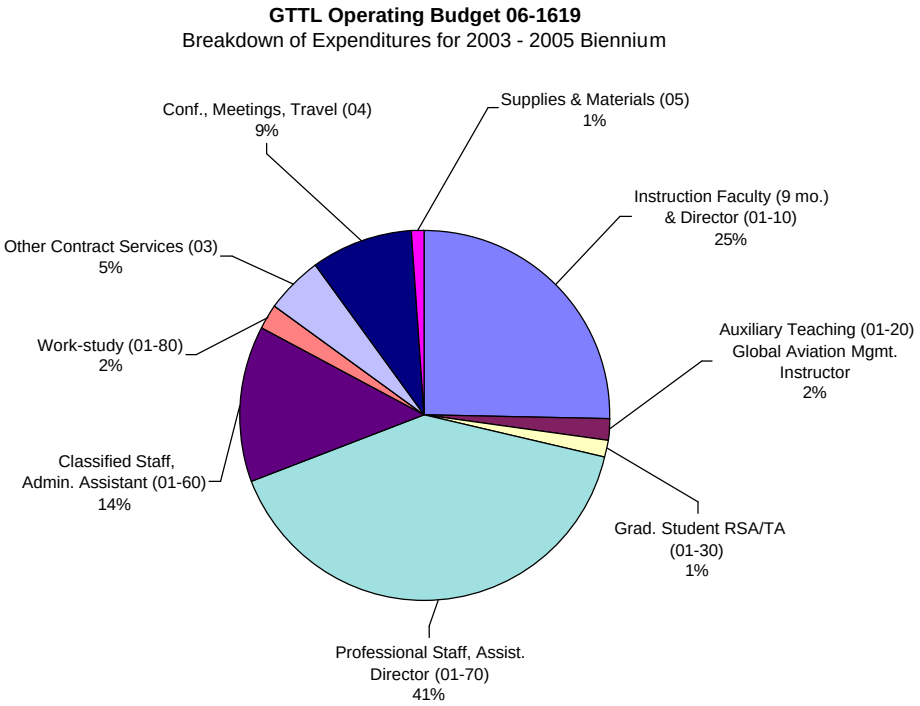
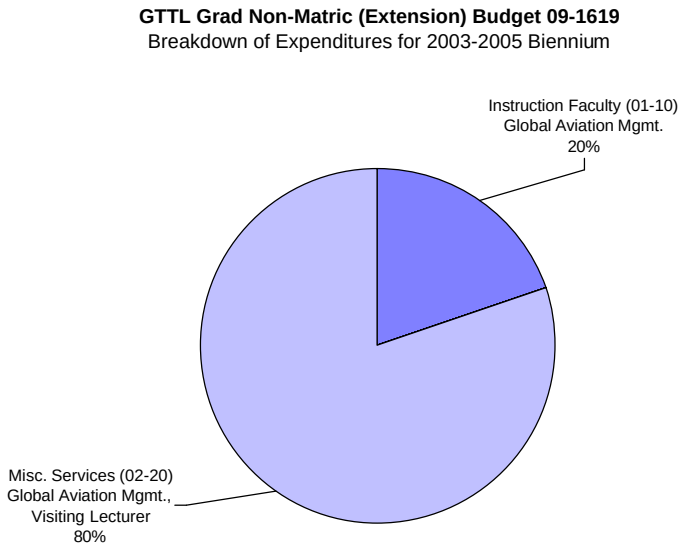


Figure 5



For the future, we ask for an increase of $24,000 per year in our operating budget. In the absence of a campus-wide reassessment of courses, we propose $9,000 of this is for compensation of the two instructors that teach the Aviation and Air Cargo Management course. As mentioned previously, we have been unable to stimulate interest in offering such a course elsewhere on campus. We also envision an increase of $15,000 per year for the new half-time Alumni Coordinator and Internal Communications Liaison.

Beyond these requests, the new organizational structure would operate within the current budget as allocated by the Graduate School. We propose reallocation of the majority of funding for Tom Schmitt to the salaries of Greg Shelton and Nicole Feodorov, to be distributed within the guidelines of UW Human Resources parameters for the respective job descriptions.[14]

I. Conclusion

Since its inception in the summer of 1995, the mission of Global Trade, Transportation and Logistics Studies has been to satisfy the needs of business and government with students knowledgeable about global commerce. GTTL offers a novel and exciting interdisciplinary graduate certificate program. None of its sixteen affiliated departments, on its own, could have launched such a program because interest in GTTL

[14] For the roles of Faculty Advisor, Chairman of the GTTL Advisory Board and instructor of GTTL 501 and GTTL 502, we propose that Tom Schmitt would receive summer funding, a course-load reduction, and a teaching assistant for the large section of GTTL 501.

topics is often limited to a few faculty in each department. The mix of specialties in GTTL's curriculum mirrors the real world of the global economy, with a focus on the flow of goods from point-of-origin to point-of-consumption across international boundaries. Interdisciplinarity is demanded in practice, and GTTL's program is well positioned to meet the ever-expanding needs of business and government for integrated education in global commerce. GTTL's topical coverage appears to be as broad, or broader, than that of other programs in the United States, and its educational services are provided efficiently.

In collaboration with UW Extension, GTTL launched the Global Supply Chain Management Program for Extension students. Also, in response to Advisory Board feedback and student demand, GTTL admits a few exemplary undergraduate students into the its Program each year. These Extension and undergraduate students have mixed quite well with the degree-bound GTTL graduate students in its core courses.

GTTL's program quality is evident in many ways: innovative core courses, supportive elective courses, library resources, newsletter, web page, outreach activities, and a commitment to diversity. Students enjoy opportunities for internships, scholarships, and individualized study with program faculty and U.S. National Laboratories.

GTTL's success begins with the quality of its core and affiliate instructors, whose goals are to provide intellectually challenging, rich, and unique learning experiences. GTTL's core instructors have developed innovative approaches and materials in the core courses. They provide orientation and facilitate interaction and cooperation among a diverse set of interdisciplinary students, many of whom are working together for the first time. They have discovered creative ways to build teamwork, break language barriers, bridge gaps, and hone interdisciplinary skills. Instructors who offer affiliated electives also strive to offer rich and diverse learning experiences. Altogether, the core and elective courses provide a unique balance of breadth and depth across fields, offering disciplinary rigor and diversity. Graduate education is enhanced by these relationships, through the students' exposure to the differing schools of thought intermingled in the classes.

GTTL's primary missions are teaching and service, but its core and affiliated faculty, in collaboration with GTTL students, are active in research as well. Interdisciplinary teams of students address research problems, with the result being exceptionally thorough, balanced, and informed research. This interdisciplinary mix is augmented by practitioners who enroll through UW Extension. Professionals in government and industry often seek our students' research.

Relationships with GTTL's affiliate departments and organizations are key to the success of its interdisciplinary program. These relationships are maintained through the individual efforts of GTTL staff who include affiliates in plenary meetings, seek their advice, conduct joint courses whenever possible, and offer affiliated students means by which to enhance their educational experience. The alumni network GTTL has created

helps to fulfill the needs of business and government for students trained in topics related to global commerce. As further evidence of supportive external relations, the Boeing Company's contributions to GTTL's scholarship fund have enabled GTTL to offer a monetary scholarship to each student.

Though the GTTL program has been highly successful in implementing the vision of its founders, there are a number of areas that require more attention and fine-tuning before this program can truly realize its full potential of serving the greater University community. Major challenges that all interdisciplinary programs face include keeping an ongoing dialogue with students, sustaining a core of interest within affiliated departments, setting student expectations, and operating with limited staff and budget. Overcoming impediments in approaching other units, solidifying old relationships and fostering new ones are currently being addressed by the Graduate School. GTTL welcomes participation in this process of shared governance and promotion of interdisciplinary collaboration.

GUIDELINES FOR SELF-STUDY: APPENDICES

Appendix A. Graduate Student Statistical Summary (10-year data)

Graduate Student Statistical Summaries for the GTTL Studies Certificate Program are not available; these reports are generated for Masters and Doctoral programs only.

Appendix B. Academic Unit Profile

The Academic Unit Profile for GTTL Studies (see **Exhibits B-1 and B-2** below) is incomplete. According to the Office of Institutional Studies, little historical data has been generated about GTTL and stored in the mainframe systems (which are the ultimate data source(s) for the academic profiles).

Exhibit B.1

DEPARTMENTAL ACADEMIC PROFILE FOR 2004

GTTL

DEAN-GRADUATE SCHOOL

SECTION 1 - WHAT RESOURCES HAVE BEEN AUTHORIZED?

Budget By Program, Source And Fiscal Year

	FY 2001-02		FY 2002-03		FY 2003-04		FY 2004-05	
Program	GOF	DOF	GOF	DOF	GOF	DOF	GOF	DOF
01 - Instruction	141,844	-	141,844	-	144,135	-	146,791	-
02 - Research	-	-	-	-	-	-	-	-
03 - Public Service	-	-	-	-	-	-	-	-
04 - Primary Support Services	-	-	-	-	-	-	-	-
Total	141,844	-	141,844	-	144,135	-	146,791	-

	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05
Grant & Contract Expenditures	-	2,459	8,913	3,741

Staffing, Budgeted Count Or FTE By Program, Source And Fiscal Year

	Faculty Count (01-10 & 01-20)			TA Count (01-30)			Other FTE (01-40, 01-50, 01-60,etc)		
	FY 02-03	FY 03-04	FY 04-05	FY 02-03	FY 03-04	FY 04-05	FY 02-03	FY 03-04	FY 04-05
Program	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF	GOF & DOF
01 - Instruction	0.5	0.5	0.5	-	-	-	2.5	2.5	2.5
02 - Research	-	-	-	-	-	-	-	-	-
03 - Public Service	-	-	-	-	-	-	-	-	-
04 - Primary Support Services	-	-	-	-	-	-	-	-	-
Total	0.5	0.5	0.5	-	-	-	2.5	2.5	2.5

SECTION 2 - HOW WERE THESE RESOURCES USED?

Student Credit Hour Enrollment, By Type of Major, AY 2004-05

Type of Major	Undergrad	Graduate	Profess.	Total
Majors From This Department				-
Majors Out of This Department				-
Pre & Extended Majors				-
Total	-	-	-	-

SCH & Enrollees by Course Offering Department, AY 2004-05

Course Level	Course Enrollees	SCH
Lower Division		
Upper Division		
Sub-Total	-	-
500 & Above		
Total	-	-

Enrollment Offerings, Utilization, and Average Class Size, AY 2004-05

Course Level	Offered Enrollment	Total Enrollment Demand	% Offered Enrollment Taken	% Enr Demand Satisified	Average Class Size
Lower Division	-	-			
Upper Division	-	-			
Sub-Total	-	-	-	-	-
500 and Above	-	-			
Total	-	-	-	-	-

SCH Instructed by the Department's Personnel, AY 2004-05

Faculty (01-10 & 20)	TAs (01-30)	Other	Total
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

SECTION 3 - WHAT WERE THE OUTCOMES?

Student Course Evaluation (5 to 1 scale with 5=Excellent)

Course Level	Faculty	TA
Lower Division		
Upper Division		
500 and Above		

Undergrad Satisfaction - 6 Months After Graduation (5 to 1 scale with 5 = Excellent)

Readiness for Career
Readiness for Advanced Study
Instruct Quality In Major
Instruct Quality Out of Major
Fac Interaction Outside of Class
Fac Assistance-Pursuing Career

Grad Student Rating of UW Experience Upon Graduation (5 to 1 scale with 5 = Highest Rating)

Criteria	Masters	Doctoral
Overall Program Quality		
Adequacy of:		
Research/Training Opportunities		
Space, Facilities & Equipment		
Supervision/Guidance		

Time To Degree, AY 2004-05

Degree and Status	Number of Degrees	GPA	Average UW Degree Credits Attempted	Average UW Degree Credits Earned	Average FTE Quarters	Avg Number Crt Enrolled at UW Full Time	Avg Number Crt Enrolled at UW Total	Calendar Yrs Median	Grad Effic. Index
Non-Transfer									
Bachelor									
Masters									
Doctorate									
Professional									
Transfer									
Bachelor									
Professional									

Planning & Budgeting, fadbook@u.washington.edu
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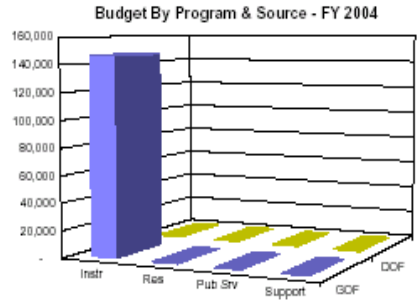
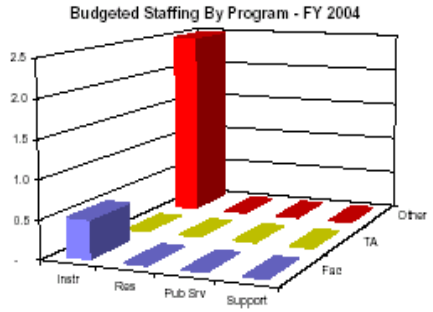
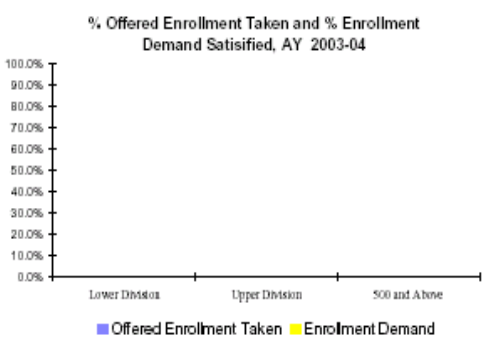
Page 1 of 2

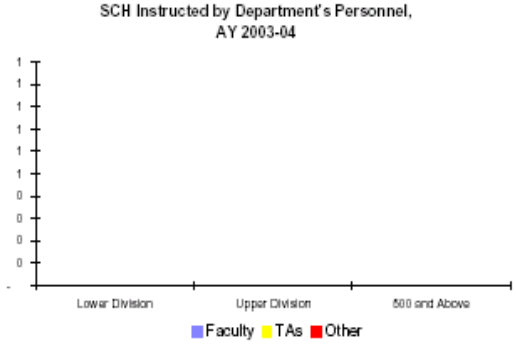
Exhibit B.2

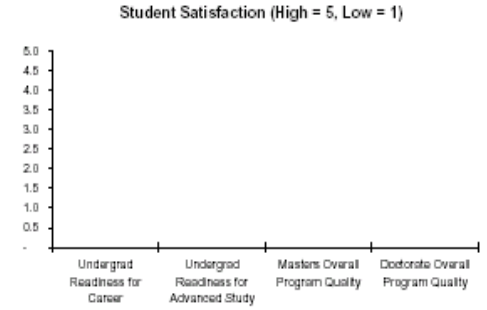
DEPARTMENTAL ACADEMIC PROFILE FOR 2004

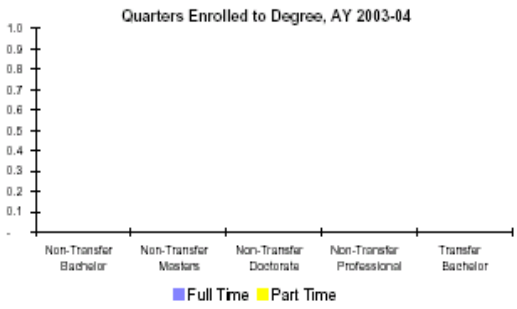












Notes and Sources:

Section 1: Budget and Budget Staffing is for the indicated fiscal years and program for all budgets GOF and DOF budgets. Budgeted data for FY 01 is as of 1999 biennum month 25.Budgeted data for FY 02 and 03 is as of 2001 biennum month 25.Budgeted data for FY 04 is as of 2003 biennum month 14 Data is for permanent budget.

Grant and Contract expenditures are as of biennum year/month 1999/25B for FY 2001 and 2001/12C for FY 2002.

Grant and Contract expenditures are as of biennum year/month 2001/25B for FY 2003 and 2003/12C for FY 2004. G&C expenditures are for all budget type 05 budgets.

Other FTE is total staff months divided by 12. Faculty and TA count is staff months divided by service period (but not less than 9) times FTE.

Section 2: All data is as of the 10th day of enrollment of each quarter of the academic year 2003-04 (excluding summer quarter). SCH data by Type of Major includes double majors and counts enrollment once for each major. SCH and course enrollment data by Course Offering Department is reported on a "where taught" basis. SCH Instructed by Department's Personnel is data reported on a "who taught" basis.

Section 3: Student Course Evaluations are for the academic year 2003-04 and are provided by the Office of Educational Assessment. There are no Undergraduate Satisfaction ratings as these are provided by the Office of Educational Assessment only every other year. Graduate Student Ratings are provided by the Graduate School and are taken from the Graduate Exit Questionaire for AY 2003-04

Time to Degree data was prepared by the Office of Institutional Studies from data extracted from the Student Information System. Data is for all 2003-04 degree awards excluding double major and fifth year degrees.

Appendix C. List of special pathways, options, certificates

- Graduate Certificate in Global Trade, Transportation, and Logistics Studies. Requires a minimum of 20 course credits, including 2 Core GTTL Courses (4 credits each) and 4 electives courses (totaling at least 12 credits) with at least one elective course taken outside of the student's home department.

- Extension Certificate in Global Supply Chain Management
  Requires a minimum of 9 course credits, including 2 Core GTTL Courses (4 credits each) and a 1 credit practicum.

Appendix D. List of faculty by rank

Tom Schmitt, Associate Professor, Operations Management, Business School
Greg Shelton, Lecturer, Global Trade, Transportation, and Logistics Studies
Jess Browning, Affiliate Professor, Civil and Environmental Engineering
Christopher Fidler, Lecturer, Business School

Appendix E. Placement of graduates, last 3 years (include data on placements outside the academy)

GTTL recognizes that post-graduation employment, starting salaries, and career progress are often cited as important criteria in judging program effectiveness. Because the UW Alumni Association does not track the progress of academic certificate recipients, GTTL has critical need of personnel dedicated to this task. Due to the program's limited staff (1.5 FTE), GTTL does not have the resources to develop computer systems, and initiate the networking and follow-up activities that are essential in maintaining an extensive alumni data base.

Appendix F. Academic Unit's mission statement

The Global Trade, Transportation, and Logistics (GTTL) Studies Program at the University of Washington strives to prepare its graduate students for careers in international commerce. The mix of specialties that has been built into GTTL curriculum mirrors the real world of the global economy, with particular attention to activities involved in the flow of goods from point of origin to point of consumption across international boundaries. These activities include: manufacturing, procurement, distribution, transportation modes (maritime, aviation, and surface), inter-modal connections, and supply chain management. Issues related to advancements in security, telecommunications, information, infrastructure, environmental protection, humanitarian relief, energy, regulation, as well as other issues that facilitate or constrain global commerce are considered. The GTTL learning environment provides students with a firsthand connection to a wide range of prominent professionals and organizations in the field.

Appendix G. Abbreviated Faculty Curriculum Vitae

Please see **Attachment 8**.

Appendix H. HEC Board summary

a. Name of unit authorized to offer certificates

Global Trade, Transportation, and Logistics Studies

b. Affiliated Schools and College(s)

- Business School
- College of Education
- College of Forest Resources
- Daniel J. Evans School of Public Affairs
- Department of Aeronautics and Astronautics
- Department of Civil and Environmental Engineering
- Department of Communications
- Department of Economics
- Department of Geography
- Department of Industrial Engineering
- Department of Political Science
- Department of Technical Communications
- Department of Urban Design and Planning
- Henry M. Jackson School of International Studies
- School of Law
- School of Marine Affairs

c. Exact title(s) of certificates offered

- Graduate Certificate in Global Trade, Transportation, and Logistics Studies.

- Extension Certificate in Global Supply Chain Management

d. Year of last review

The GTTL Studies Program was formally adopted by the Graduate School in June, 1995. This is its first program review.

e. Brief description of the field and its history at the University of Washington.

The GTTL Program was first envisioned in 1995 when the UW Office of Research became aware of unmet needs on the part of various business and government organizations involved in trade, transportation and logistics. The Office established an investigation team called the Working Group on

Transportation (WGT). The WGT, in turn, organized an industry panel. This panel provided a compelling rationale for well-educated university graduates in the Pacific Northwest knowledgeable about global commerce. The WGT found that relevant courses exist in many academic departments, but are not well known to students from other departments. These courses were also poorly coordinated with respect to class size and prerequisites. The Final Report of the WGT specifically recommended the establishment of a "certificate program" that would be University-wide and interdisciplinary, as well as integrate the topics of global trade, transportation and logistics.

The GTTL Certificate Program, formally adopted on June 9, 1995, was designed to enable professionally oriented graduate students to augment their degree programs in preparation for careers that demand integral knowledge of trade, transportation and logistics. The mix of specialties that has been built into GTTL curriculum mirrors the real world of the global economy, with particular attention to the flow of goods from point-of-origin to point-of-consumption across international boundaries. This includes manufacturing, modes of transportation, intermodal connections, and logistics management. GTTL also considers issues and systems that facilitate or constrain global commerce, including advances in security, telecommunications, information, infrastructure, environmental protection, humanitarian relief, energy, and regulation. All University of Washington graduate and professional students are eligible for the GTTL Certificate. The majority of GTTL Certificate Candidates come from the sixteen aforementioned departments and colleges.

In accordance with its original mission, the GTTL Program has been responsive to the needs of government and industry. For example, a special Advisory Board drawn from the University and private and public sectors oversees the GTTL Program. Following direction from its Advisory Board and public demand, GTTL and the UW Extension Program have developed a Global Supply Chain Management Certificate for Extension students. Now in its fourth year, the Extension students have mixed quite well with the degree-bound GTTL students in the core courses. Most of the Extension students are professionals working in relevant fields and have contributed significantly to the collective learning experience of the core courses. As the program has matured, GTTL continues to offer its students valuable learning experiences with a diversity of perspectives and opportunities.

f. Documentation of continuing need for your program

We draw from various sections in the Self-Study Narrative to summarize details in three areas: demand for GTTL skills in today's economy, comparison with other U.S. programs, and program and course statistics. Please refer to the Narrative for more details.

Demand for GTTL Skills in Today's Economy: Skills in global trade, transportation and logistics are in high demand nationally. The recent surge of interest in supply chain management suggests the need to view the individual organizations from a total systems perspective. According to the 2002 database of Herbert W. Davis and Company, the total cost of logistics in the U.S. was split with 43% attributed to transportation between firms and the remaining 57% associated with material management and warehousing activities within firms. With the recession over the past several years, firms have been able to compensate for sagging sales to some extent by cutting costs throughout their product supply chains. Logistics has become a key area of leverage for firms. Consequently, logistic costs were reduced by an average of almost 8% during the year 2002.

Logistics expenditures averaged 7.65% of unit selling price, but this percentage is biased because of the large amount of domestic commerce in the United States. When goods move across national borders, this percentage can increase to 25% of unit sales. **Figure 3** in the Self-Study Narrative shows some of the activities that contribute to these international costs. According to the ARC Advisory Group , "A typical cross-border shipment … changes hands more than ten times, involves completing and filing about 15 documents, interfacing about 25 parties, and being in compliance with over 600 regulations and 500 trade agreements that are constantly changing." [*]

All this complexity suggests opportunities for improvement. Firms are understandably seeking them. Low labor rates afforded by underdeveloped and developing countries contribute to continued outsourcing and offshoring from developed countries such as the U.S. Regardless of a country's stage of development, comparative advantage along with differences in resource and technology suggest that international trade will continue to increase, as will demand for individuals with the skills GTTL offers.

Comparison with other U.S. Programs: GTTL's interdisciplinary program is well positioned to meet ever-expanding needs of business and industry for integrated education in global commerce. In January 2005, the Journal of Commerce reported a summary of 152 college-level programs in the United States that cover various aspects of global trade, transportation and logistics. The study shows, for each, the nature of the education (undergraduate, graduate, professional certification, executive/seminar) along with a paragraph summary of the program. We summarize the details in **Attachment 1**. In GTTL's market space, 62% of the programs provided graduate education, and 34% offered certification. However, only 7% indicated interdisciplinary topical coverage. Besides GTTL, only three schools offered the combination of graduate education, professional certification and interdisciplinary coverage. Furthermore, two of these three programs are housed within schools of business and most likely enjoy

[*] "Linking Supply Chain Security with Sarbanes-Oxley and the Bottom Line," ARC Advisory Group, August 2004.

the full support and focus of departmental ownership. GTTL's rather unique ability to offer an interdisciplinary graduate certificate, not a departmental degree, suggests that it provides education efficiently with limited dedicated headcount and budget.

We conducted a more focused study of 11 well-known programs by inspecting brochure information regarding program descriptions and course coverage (see **Attachment 2**). We observed the following offerings among the 11 programs:

- 90.91% Graduate
- 54.55% Certificate
- 27.27% Interdisciplinary
- 100.00% Logistics /Supply Chain Management
- 45.45% Transportation
- 54.55% Global

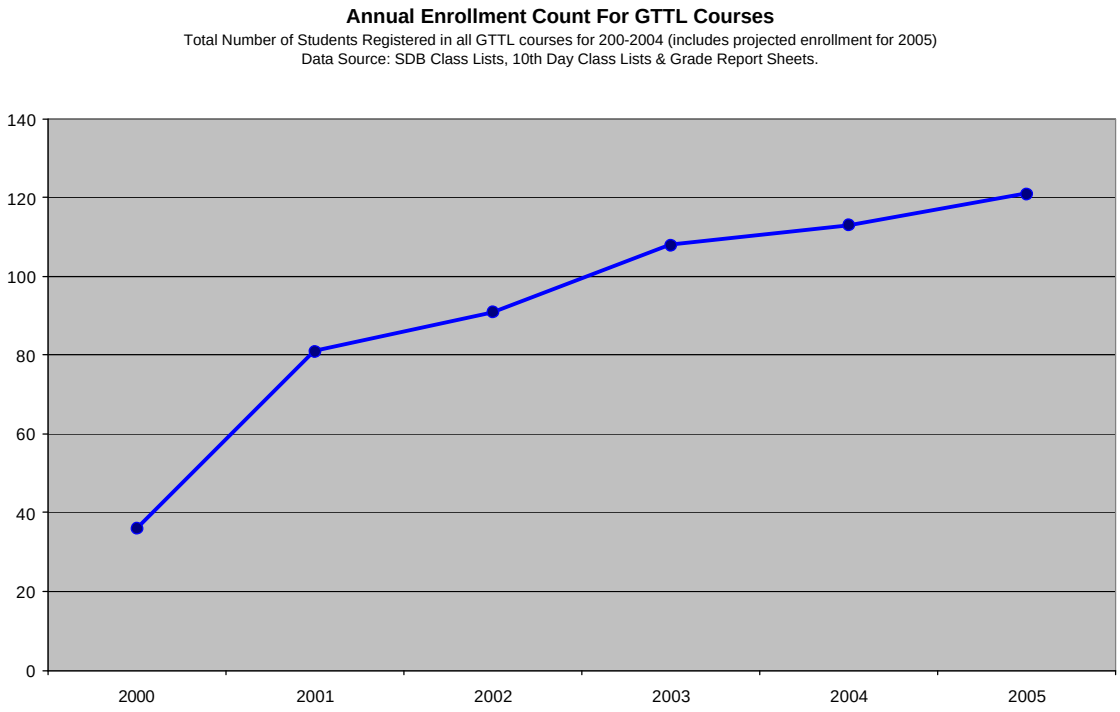
We wish to qualify our findings by emphasizing that we did not conduct in-depth studies of these programs beyond what could be gleaned from brochure information. We find it interesting, at least in this cursory investigation, that none indicated a combination of graduate education, professional certification, and interdisciplinary topical coverage. Additionally, program literature of only two of the program stressed integrated education over the combined fields of logistics/supply chain management, transportation and global commerce.

As further evidence of the lack of integrated education, Bonney and DeWitt lament that despite transportation's lions share of logistics costs of today's commerce, few programs demonstrate beyond lip service a commitment to transportation education (**Attachment 3**). They claim that few programs offer even one course in the broad field transportation, and this list of programs has been shrinking over the last decade.

All this supports our belief that GTTL's coverage appears to be as broad, or broader, than other programs, and our virtual program provides this education efficiently.

Program and Course Statistics: Student interest in GTTL has been high, as indicated by the steady increase in student enrollment (**Exhibit H.f.1**) and the number of certificates granted annually (**Exhibit H.f.2**).

Exhibit H.f.1



* Spring 2005 is based on preliminary enrollment.

Exhibit H.f.2

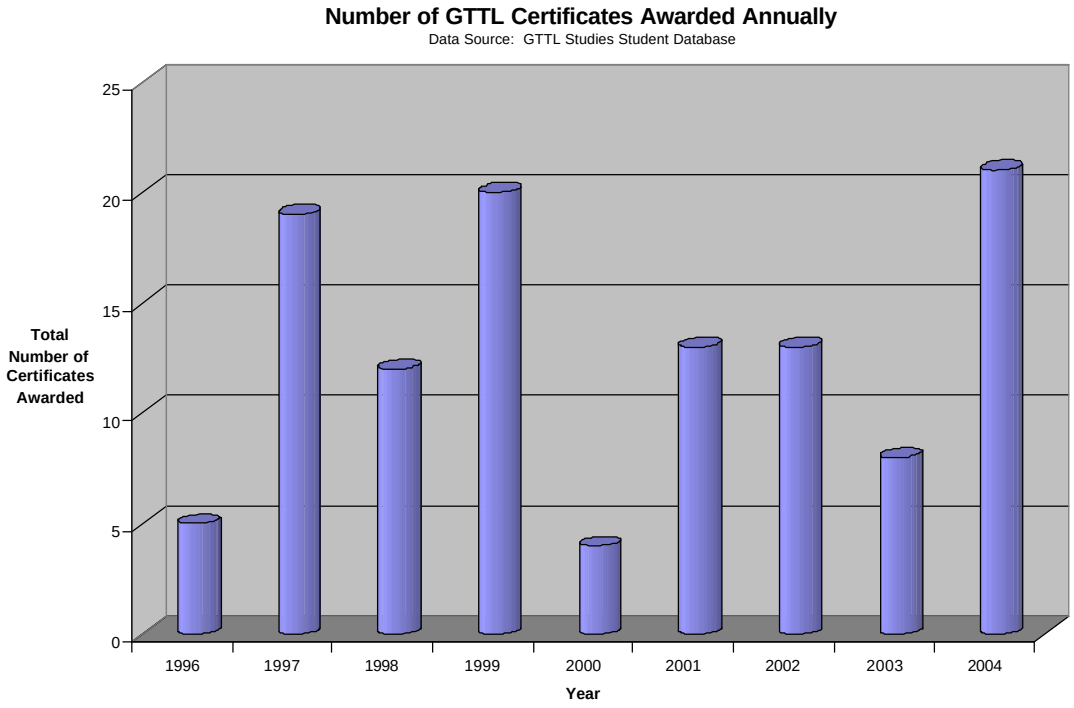
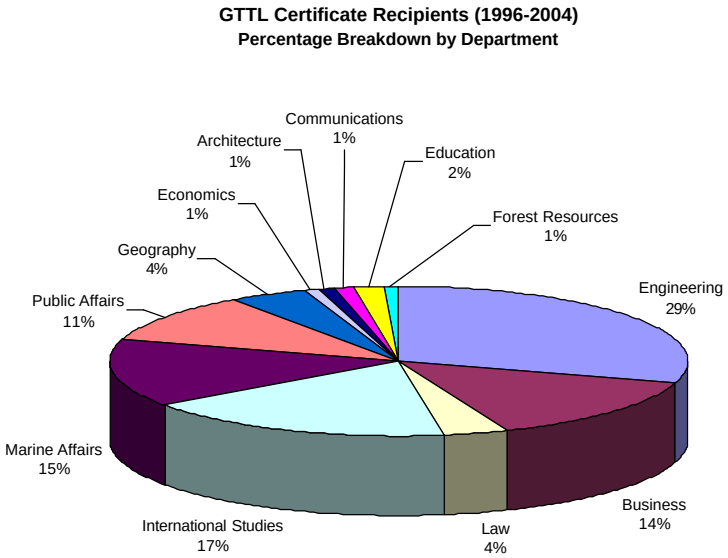


Exhibit H.f.3 reflects a relatively balanced mix across disciplines of certificate recipients.

Exhibit H.f.3



From the start, we imagined a core faculty group and curriculum that was not merely an aggregate of different disciplinary interests, but the product of truly interdisciplinary scholars, research projects, and courses. The core courses—GTTL 501 and 502—review the academic theories, political-economic structures, industrial dynamics, public policies, strategic issues, and tactical problems (see syllabi in **Attachment 6**). GTTL 501, offered in the fall and winter, covers basic concepts of trade, transportation, and logistics, and prepares students for GTTL electives. For this course we have developed cases, innovative simulations, streamed videos and an online course syllabus that provides links to various course materials (explore http://depts.washington.edu/gttl). Success in the course may be measured in many ways. The course ratings have been solid (**Exhibit H.g.1**). Another indicator is the sustained and growing demand for the course. For example, we had to turn away 15 students on the first day of fall quarter 2004 because the classroom allows only 47 students.

The second core course, GTTL 502, is an interdisciplinary seminar offered in the spring quarter that covers a timely theme on a GTTL topic. We offered seminars on security in commerce when few knew much about the subject, but were anxious to learn. Three years ago the GTTL 502 theme was "Commerce Security Issues and Trade Impacts in the Context of the September 11, 2001 Terrorist Attacks." We followed up two years ago with the theme "Security, Economy and Liberty: How Can They Coexist?" Last year we tackled the issue of outsourcing with the theme "Reinventing Business, Government and Infrastructure to Embrace Emerging Trade Partnerships with China and Other Asian Countries." 502 is designed in conjunction with the annual GTTL conference at the conclusion of spring quarter. In addition to keynote speakers, student teams prepare and present interdisciplinary research papers on the theme at the conference. Demand for GTTL 502 has been strong and the course ratings exemplary (**Exhibit H.g.1**).

Success also lies in the quality of the affiliated electives. Many of the elective courses have been quite successful, including the Geographic Information Systems series from Geography, International Business courses, and transportation systems and planning courses from Civil and Environmental Engineering, to name a few.

On occasion, GTTL has funded affiliated elective courses that it deemed essential, but not likely to be offered without assistance. As mentioned earlier, GTTL has contributed funds to other departments to help them offer GTTL electives, e.g. SMA 516, Seaport Management, and GEOG 448, Geography of Transportation.

Additionally, GTTL launched a graduate course in air transportation, an important domestic and international mode of transportation. Three retired executives were interested in teaching this course in Aviation and Air Cargo Management -- Ray Waldmann, former Vice President of Governmental Affairs at Boeing, Barrie Austin, former Chief Engineer at Boeing, and Chris Fidler, former Vice President

of Governmental Affairs at Airborne Express. They have done a superb job of developing and delivering the course, which includes a quarter-long computer simulation game where teams of students run competing airlines. The course ratings have been stellar (**Exhibit H.g.1**) and the demand for the course steadily growing. Enrollment in the course most recently offered this winter has grown to 21 students.

Additionally, GTTL has established an industry-sponsored scholarship fund to encourage exceptional UW students to participate in the GTTL Certificate Program. Since Boeing began contributing five years ago, GTTL has been able to offer a monetary scholarship to each student in the program. Government agencies have also supported GTTL activities with grants for directed research. These agencies, Sandia National Laboratories and Pacific Northwest National Laboratories, requested help and expertise from GTTL on matters of security in commerce.

Close collaboration with industry leaders and government officials provides frequent anecdotal and qualitative evidence regarding the continuing need for GTTL to provide university graduates knowledgeable about global commerce. If requested, we would be happy to formally solicit this feedback.

This information shows that the program continues to meet the needs of students, government organizations, and the global trade, transportation and logistics industries.

g. Assessment information relating to student learning outcomes and program effectiveness

The exhibit below shows details about Student Evaluation of Instruction. The previous section also covers information about outcomes and effectiveness.

Exhibit H.g

GTTL Course Evaluations*

Course	Course Name	Quarter	# Students Enrolled [a]	# Completed Forms	Unadjusted Median Item 1 [b]	Item 2 [c]	Item 3 [d]	Item 4 [e]	1-4 Combined	Adjusted Median 1-4 Combined
GTTL 501	Core I	AU 2004	36	23	4	4	4.4	3.9	4	4
GTTL 501	Core I	AU 2003	38	25	3.4	3.4	3.8	3.9	3.7	3.7
GTTL 501	Core I	AU 2002	39	33	4.1	4	4.4	4.3	4.2	4.1
GTTL 599A	Core I	W 2004	15	13	4.1	4.2	4.3	4.2	4.2	3.8
GTTL 599	Core I	W 2003	19	14	4.1	4	4.2	4.2	4.1	3.8
Averages			**29.4**	**21.6**	**3.9**	**3.9**	**4.2**	**4.1**	**4.0**	**3.9**
GTTL 502	Core II	SP 2004	33	13	4.3	4.6	4.3	4.3	4.3	4.2
GTTL 502	Core II	SP 2003	32	19	4.6	4.3	4.3	4.5	4.4	4.2
GTTL 502	Core II	SP 2002	25	11	4.3	4	4.1	3.9	4.1	3.9
Averages			**30.0**	**14.3**	**4.4**	**4.3**	**4.2**	**4.2**	**4.3**	**4.1**
GTTL 599A	Global Aviation Mgmt.	WI 2004	10	6	4.5	4.5	4.7	4.8	4.6	4.3
GTTL 599	Global Aviation Mgmt.	SU 2003	10	10	4.2	4.3	4.6	4.5	4.4	4
Averages			**10.0**	**8.0**	**4.4**	**4.4**	**4.7**	**4.7**	**4.5**	**4.2**

* Individual evaluation forms are available upon request.
a. Extension students are not included in the class enrollment totals.
b. The course as a whole was?
c. The course content was?
d. The instructor's contribution to the course was?
e. The instructor's effectiveness in teaching the subject matter was?

h. Number of certificates granted in each of the last three years

Year	Number of Certificates Granted
2002	13
2003	8
2004	21

Attachment 1
Summary – Journal of Commerce Survey of U.S. Programs

University	Program Name	College	Graduate	Certificate	Interdi-sciplinary
Alabama A&M University	MBA Logistics Mgmt.	School of Business	x		
American Public University System	Transportation Mgmt.		x		
Arizona State University	Supply Chain Mgmt.	WP Carey School of Business	x		
Arkansas State University	BS Management & Marketing w/ Logistics Concentration	College of Business			
Auburn University					
Bakersfield College	Mgmt./Logistics Certificate	Business Education Department		x	
Ball State University	B.S. in Ops. Mgmt & MBA	Miller College of Business	x		
Blue River Community College	AAS w/ Certificate in Supply Chain Logistics			x	
Bowling Green State University	B.S. w/specialization in Supply Chain Mgmt.	College of Business Administration			
Brigham Young University	B.S. & M.B.A. Supply Chain Management track.	Marriott School of Business Mgmt.	x		
Burlington County College	Certificate in Logistics/Supply Chain Mgmt.			x	
California Maritime Academy	B.A in transp., mgmt, or logistics; also Global Logistics Specialist certification			x	
California State University- Long Beach	M.S. in Global Logistics & Global Logistics Specialist designation	Ctr. For International Trade & Transp.	x	x	x
Carnegie-Mellon University	BA & MBA Supply Chain Mgmt/Logistics	David A. Tepper School of Business	x		
Case Western Reserve University	MS & Certificate Supply Chain Mgmt.	Weatherhead School of Mgmt.	x	x	
Central Michigan University	BA & MBA Logistics Mgmt.	College of Business	x		
Clarion University	courses in distribution mgmt.	College of Business Administration			
Clarkson University	Global Supply Chain Mgmt.	Clarkson Univ. Ctr. For Global Competitiveness	x		
Clemson University	MS w/operations management concentration	Department of Management	x		
College of Charleston	Paul T. Nelson Global Logistics & Transportation Undergraduate Program			x	
Colorado Technical University	BS & MBA Logistics/Supply Chain Mgmt.		x		
Columbus State Community College	AA & Certificate in Logistics with a Purchasing major			x	
Cornell University	MBA includes courses in logistics and manufacturing strategy	Johnson School of Business	x		
Downling College	BS & MBA w/Aviation Management concentration		x		
Duke University	MBA - Global Executive	Fuqua School of Business	x		
Duquesne University	BS & MBA w/concentration in Supply Chain Mgmt.	A.J. Palumbo School of Business Admin	x		
East Carolina University	BS & MS in Industrial Distribution & Logistics	Department of Industrial Technology	x		
Eastern Michigan University	MBA w/supply chain mgmt. concentration & pst-bachelor's certificate	College of Businesses	x	x	
Elmhurst College	BS & MS in Logistics & Transportation Mgmt.	Center for Business & Economics	x		
Embry-Riddle Aeronautical University	Undergrad certificate in Logistics & Supply Chain Mgmt			x	
Ferris State University	BS w/concentration in operations and supply management	College of Business			
Florida Institute of Technology	Certificate & MS in logistics & transportation mgmt.	School of Extended Graduate Studies	x		x
Florida State University	BA & MBA w/concentration in supply chain mgmt.	College of Business	x		
George Mason University	MS & Certificate in transportation policy	Ctr. For Transportation Policy & Logistics	x	x	
George Washington University	MBA supply chain mgmt, Masters Plus Certificate in supply chain management	School of Business	x	x	
Georgia Institute of Technology	BS Technology and Operation Mgmt, & MBA Ops. Mgmt., & Certificate in Logistics	Logistics Institute	x	x	
Georgia Southern University	BA in logistics and intermodal transportation	College of Business			
Golden Gate University	BA & MBA w/ operations and supply chain mgmt. concentration	Edward S. Ageno School of Business	x		
Idaho State University	BA with logistics and distribution courses	College of Business			
Illinois Central College	Transportation & Traffic certificate, Materials & Logistics Mgmt. certificate			x	
Indiana State University	BA & MBA with strategic supply chain and operating decisions course.		x		
Indiana University	Supply chain management certificates offered.	Kelly School of Business	x	x	
Indiana University-Purdue University	BS & MBA w/ course in operations and decision technologies		x		
Institute of Logistical Management	Certified Logistics Practitioner			x	
Iowa State University	BS in transportation and logistics	College of Business			
John Carroll University	BS in Administration w/ concentration in business logistics	Boler School of Business			
Kutztown University	BS & MBA w/ concentration in supply chain mgmt.	College of Business	x		
Lamar University	Lamar University Center for Ports & Waterways	Lamar College Division of Texas Transportation Institute			
Lehigh Carbon Community College	Logistics Technologies certificate			x	
Lehigh University	12 credit online grad certificate in supply chain management	College of Business & Economics		x	
Lenoir Community College	AA degree w/ concentration in global logistics technology				
Long Island University-C.W. Post Campus	MBA Logistics & Supply Chain program	Business School	x		

Attachment 1 Continued
Summary – Journal of Commerce Survey of U.S. Programs

University	Program Name	College	Graduate	Certificate	Interdi-sciplinary
Loyola University	Executive-education five-day "mini-MBA" mgmt. certificate program	School of Business		x	
Maine Maritime Academy	non-credit certificate, BS, & MS in global supply chain mgmt.	Loeb-Sullivan School	x	x	
Marquette University	Interdisciplinary minor in operations & supply chain mgmt.	College of Business Administration	x		x
Marshall University	BS in marketing in logistics transportation	Lewis College of Business			
Massachusetts Institute of Technology	Center for Transportation & Logistics	Sloan School of Management	x		x
Metropolitan State University	BS & MBA includes industrial mgmt & supply chain mgmt.	Department of Management	x		
Miami University of Ohio	BS in supply chain mgmt.	Richard T. Farmer School of Business			
Michigan State University	MS & MBA with supply chain mgmt. track	Eli Broad College of Business	x		
Michigan Technological University	BS & MS with supply chain management track	School of Business	x		
Middlesex County College	30-credit certificate in transportation and distribution.	Business Admin & Mgmt Department		x	
Mississippi State University	BS & MS in Marketing w/ transportation concentration	National Center for Intermodal Transportation	x		
Montana State University	BS in Business Admin. in Marketing with courses in supply chain mgmt.				
Morgan State University	MS in Transportation	Center for Transportation Studies	x		
Niagara University	36-hour evening certificate program	Logistics Transportation Mgmt. Ctr.		x	
North Carolina A&T State University	MS in mgmt w/ transportation and logistics track	School of Business & Economics	x		
Northeast Wisconsin Technical College	Two-year school offering a supply chain/logistics program			x	
Northeastern University	BS, MBA, & graduate certificate in supply chain mgmt.	College of Business Administration	x	x	
Northwestern University	Masters of Management in transportation and logistics	Kellogg School of Management	x		
North Carolina State University	MBA in supply chain mgmt.		x		
Northern Illinois University	MBA w/ information-mgmt. concentration	College of Business	x		
Ohio State University	MBA operations/logistics mgmt	Fisher School	x	x	
Old Dominion University	Public Administration's International Maritime Ports & Logistics Mgmt. Institute	College of Business	x		
Oregon State University	MBA program includes supply chain mgmt. courses.	College of Business			
Pace University	10-course certificate program in international world trade.	World Trade Institute School of International Trade		x	
Palo Alto College	30-credit certificate in logistics mgmt.			x	
Pennsylvania State University	Joint MBA and College of Engineering Quality & Manufacturing Mgmt. program.	Smeal College of Business	x		
Portland State University	Supply & Logistics Mgmt. certificate	School of Business		x	x
Purdue University	MS, MBA in supply chain mgmt/logistics	Krannert School of Management	x		
Robert Morris University	BS w/ concentration in logistics mgmt.				
Rochester Institute of Technology	12-credit Mgmt. Development certificate, and MS in manufacturing leadership.	RTI's Ctr. For Production & Inventory Mgmt.	x		
San Jose State University	MS in transportation mgmt, & 12-credit certificate in transportation mgmt.	Mineta Transportation Institute	x	x	
Seattle University	BA in Business with a major in operations.	Albers School of Business			
Shippensburg University	MBA w/ concentration in supply chain operations.	John L. Grove College of Business	x		
Southern University at New Orleans	BS in transportation w/ marketing emphasis	College of Business			
Southwest Missouri State University	MBA w/concentration in Logistics International Mgmt.	College of Business Administration	x		
St. Cloud State University	Undergraduate mgmt. program w/courses in supply chain mgmt.				
Stanford University	Supply Chain Mgmt/Logistics program		x	x	
Sullivan University	BS in Business administration in logistics and distribution				
SUNY Maritime College	MS in International Transportation Mgmt, and some certificate courses are offered.		x	x	
Supply Chain Security Inc.	Supply Chain Security e-Learning Campus			x	
Syracuse University	MBA concentration in supply chain mgmt.	Whitman School of Management		x	
Texas A & M at Galveston	Undergrad programs in Marine Transportation, Administration and Maritime Studies				
Texas A & M University	MS in mgmt w/ supply chain mgmt. track	Mays Business School	x		
Texas Christian University	MBA and 12-credit certificate in supply chain mgmt.	M J Neeley School of Business	x	x	
Thomas Edison State College	AA in Science in transportation distribution mgmt.			x	
Trade Security Institute	Executive seminars	Dema Education company			
Tuck Executive Education at Dartmouth University	Executive education program in mgmt includes supply chain integration				
University of Akron	MBA supply chain mgmt.	College of Business Administration	x		
University of Alabama	MA in strategies marketing mgmt which includes one course on logistics mgmt.	Culverhouse College of Commerce & Business Admin.	x		
University of Alaska Anchorage	Certificate in Logistics, MS in global supply chain mgmt.	College of Business & Public Policy	x	x	
University of Arkansas	MA in transportation & logistics mgmt.	Sam Walton College of Business	x		
University of California, Berkeley	Logistics certificate available to Masters students in business and engineering		x	x	x
University of Chicago	MBA courses in supply chain strategy		x		
University of Cincinnati	MBA, MS w/concentration in operations mgmt.	College of Business	x		
University of Colorado at Boulder	MBA & certificate w/concentration in operations mgmt	Leed School of Business	x	x	
University of Denver	MS in intermodal transportation mgmt.	Intermodal Transportation Institute	x		
University of Florida	MBA w/ concentration in supply chain mgmt.	Warrington College of Business	x		
University of Georgia	MBA w/ international trip	Terry College of Business	x		
University of Louisville	Grad certificate in logistics and distribution is offered	Logistics & Distribution Institute		x	
University of Maryland	MBA w/logistics/supply chain concentration, and executive education	Robert H Smith School of Business Logistics	x	x	
University of Memphis	MBA w/ courses in global transport and operations	Fogelman College of Business & Economics	x		
University of Michigan	MBA and executive MBA in operations mgmt		x	x	

Attachment 2
Summary of Selected U.S. Programs

University	Program Name	College	Graduate	Certificate	Interdi-sciplinary	Logistics/ Supply Chain Mgmt	Transportation	Global
Arizona State University	Supply Chain Management	W.P. Carey School of Business	1			1		1
California State University- Long Beach	MS in Global Logistics & Global Logistics Specialist Designation	Center For International Trade & Transportation	1	1	1	1	1	1
Georgia Institute of Technology	BS Technology and Operation Mgmt.; MBA Ops. Mgmt.; and Certificate in Logistics	Logistics Institute	1	1		1		1
Massachusetts Institute of Technology	Center for Transportation & Logistics	Sloan School of Management	1		1	1	1	
Michigan State University	MS & MBA with supply chain mgmt. track	Eli Broad College of Business	1			1		1
Northwestern University	Masters of Management in transportation and logistics	Kellogg School of Management	1			1	1	
Ohio State University	MBA operations/logistics mgmt	Fisher School	1	1		1		
Texas Christian University	MBA and 12-credit certificate in supply chain mgmt.	M. J. Neeley School of Business	1	1		1		
University of Denver	MS in intermodal transportation mgmt.	Intermodal Transportation Institute	1		1	1	1	1
University of Tennessee	Supply Chain Mgmt/Logistics program	College of Business Administration	1	1		1	1	
Wright State University/NASBITE	NASBITE Certified Global Business Professional	North American Small Business International Trade Educators (NASBITE)		1		1		1
		Total	10	6	3	11	5	6
		Average	90.9%	54.5%	27.3%	100.0%	45.5%	54.5%

Attachment 3

Basic Training

By: JOSEPH BONNEY

William J. DeWitt is a professor of logistics, transportation and supply chain management at the University of Maryland's business school. Not long ago, he was comparing notes with a counterpart at another major university with a well-regarded logistics program.

DeWitt's friend remarked that his school no longer taught transportation as a stand-alone course, but had folded it into a broader class on supply chain management.

How much instruction time was devoted to transportation? DeWitt asked. About two weeks, his friend replied.

"I said, 'Wait a minute,'" DeWitt recalled. "Transportation is at least 60 percent of logistics costs, and they're giving it two weeks out of a 15-week semester, four classes out of 30? Something seems out of balance."

DeWitt says he's troubled by the de-emphasis on transportation in logistics and supply chain curriculums at many colleges and universities. He says the trend has been building for years, fueled by three major developments:

First, a foundation-funded study in 1959 that faulted business-school curriculums for an excessive vo-tech orientation, and cited transportation courses. Second, deregulation, which allowed companies to organize supply chains on economic principles instead of regulatory requirements. And third, the emergence in the 1990s of information technology that quickly assumed a central role in logistics education.

DeWitt isn't campaigning for universities to offer a transportation major, or to cut back on current logistics classes. He doesn't dispute the need to provide students with a broad understanding of supply chain management, or to teach them to use software tools such as enterprise planning resource systems. But he would like to see universities include transportation as a key part of their overall logistics and supply chain curriculum.

He says logistics students receive first-rate training in technology, but many aren't being provided with a thorough grounding in the nitty-gritty work that underpins supply chains.

DeWitt admits he's biased. Before entering academia, he spent a quarter-century in the railroad industry. There he learned that transportation doesn't always work the way it should, and that when an unexpected disruption occurs, a basic understanding of transportation is essential.

Transportation usually runs smoothly, despite occasional disruptions such as the West Coast port shutdown of 2002, the rail capacity problems of recent years, and the effects of floods, storms and other natural disasters.

Consequently, DeWitt says, many people in the business today have "an inherent assumption that transportation will continue to function well. But when it doesn't, will we have people in place who know what their options are? ERP is a great tool, but ultimately that's what it is, a tool. The base of the business is still materials-handling, warehousing and transportation, and you have to know how it works."

Joseph Bonney is editor of The Journal of Commerce. He can be reached at (973) 848-7139, or via e-mail at jbonney@joc.com.

Attachment 4
Electives in Frequency Order

Course #	Course Title
SMA 517	Marine Transportations and Committee
IBUS 579	Special Topics
IBUS 550	Export Projects
SMA 516	Seaport Management
OPMGT 535/GTTL 501	Logistics/Physical Distribution Management [May count as Core 1 and/or Operations Management elective]
PB AF 537	International Development and Economic Policy
GEOG 448	Principles of Transportation Geography
CEE 416	Urban Transportation Planning
GTTL 599B	Global Aviation Management
CEE 410	Traffic Engineering Fundamentals
GTTL 599	Special Topics in Global Trade, Transportation and Logistics Studies
LAW A578	International Commercial Law
PB AF 534	International Affairs
GEOG 460	Geographic Information Systems
PB AF 551	Public Management: Program Planning and Design
SIS 501	Seminar, International Political Economy
CEE 589	Transit Systems Planning
GEOG 447	Air Transportation
GEOG 461	Urban Geographic Information Systems
CM 565	Managing International Projects
GEOG 449	Ocean Transportation
IBUS 471	Management of International Trade Operations 2
SMA 519	Marine Policy
ADMIN 510	Integrative Administration
ECON 471	International Trade
GTTL 600	Independent Study
LAW A510	Sales
MKTG 570	International Marketing
SMA 508	National Maritime Policy Processes
GEOG 435	Industrialization and Urbanization in China
LAW A585	Admiralty
LAW B516	International Contracting Negotiating and Drafting U.S./Asia Commercial Transactions
OPMGT 550	Project Management
SIS 534	International Affairs
SIS 551	Comparative Administrative Systems
IBUS 480	Multinational Management
IBUS 490	Special Topics in International Business
IBUS 560	Multinational Business Management
OPMGT 575	Manufacturing Planning & Control
BA 545	Global Business Forum
BECON 528	International Financial Management
CEE 584	Analytical Methods in Transportation I
F M 423	International Marketing of Forest Prods.
GEOG 463	Geographic Information Systems Workshop
IBUS 470	Management of International Trade Operations 1
SISEA 543	Law in East Asia: China
BECON 579	Selected Topics….
CEE 583	Airport Engineering
CEE 590	Traffic Systems Operations
ECON 571	International Trade [Either 471 or 571 counts as an elective, not both.]
F M 588	Current Topics in Intl. Forest Prods.Trade
GEOG 440	Regional Analysis
GEOG 498	Economic Geography
GEOG 531	Latin American Seminar
GTTL 601	Internship in GTTL Studies
HRMOB 540	Cross-Cultural Management
IBUS 440	Business in Asia
LAW B 551	Comparative Asian Law Seminar
LAW B563	Marine Policy Seminar
LAW B599F	Int'l Sales Transactions
MKTG 579	Global Information & Telecommunications Industry
PB AF 553	Regulatory Policy
POLS 410A	Technology, Politics and the State
POLS 522	International Political Economy
POLS 534	International Affairs
POLS 544	The Politics of Market Transitions
SISEA 468	China's Economic Reforms: Integration into the World Economy
SISRE 455	Marine Business Environment in Russia and Eastern Europe
SMA 514	Marine Pollution Management & Policy
URBDP 479	The Urban Form
URBDP 481	Metropolitan Planning and Development in Developing Countries
CEE 581	Travel Demand Forecasting

Attachment 5
Curriculum Examples

Business Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
BA 545	Global Business Forum
IBUS 570	International Marketing
BECON 528	International Financial Management
SIS 501	Seminar International Political Economy

Civil Engineering Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
CEE 410	Traffic Engineering Fundamentals
CEE 416	Urban Transportation Planning
GEOG 461	Urban GIS
CEE 589	Transit Systems Planning

Geography Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
GEOG 440	Regional Analysis
GEOG 460	Geographic Information Systems
GEOG 531	Latin American Seminar
SMA 517	Marine Transportations and Committee

Industrial Engineering Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
GTTL 600	Independent Study
OPMGT 550	Project Management
INDE 570	Supply Chain Systems
INDE 521	Quality in Manufacturing Systems
INDE 599	Real Time Enterprise Control

International Studies Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
SIS 501	Seminar International Political Economy
SIS 534	International Affairs
PBAF 537	International Development and Economic Policy
GTTL 601	GTTL Internship

School of Marine Affairs Concentration:

GTTL 501	Global Logistics Management
GTTL 502	Seminar in Global Trade, Transportation, and Logistics
SMA 516	Seaport Management
SISRE 455	Marine Business Environment in Russia and Eastern Europe
SMA 508	Nat'l Maritime Policy Processes
SMA 517	Marine Transportations and Committee

Attachment 6
Core Svllabi

GTTL 501/OPMGT 535

Global Logistics Management

Autumn Quarter 2004

Professors: Tom Schmitt, Greg Shelton

CONTACT INFORMATION

- Email: gttl@u.washington.edu
- Phone: 616-5778, Cell: 940-3689
- Web: http://depts.washington.edu/gttl
- Office: 313 Loew Hall
- Office hours: by appointment

MEETING TIME/LOCATION

Monday 6:00-8:50 PM, Balmer Hall, Room 307

COURSE CONTENT

GTTL 501/OPMGT 535 is a course that deals with making and moving goods through national and international markets. The mission is to get the right goods and services to the right place, at the right time, in the desired condition, and at the least cost. Course topics include supply-chain management, manufacturing scheduling, capacity planning, distribution, procurement, logistics decision-support systems, facility location, transportation routing and scheduling, transportation modes, inter-modal handoffs, international trade, regulation, private-public partnerships, strategic alliances, port management and security in commerce. The course uses lectures, videos, case discussions, readings, quantitative exercises and competitive games to explore the structure and dynamics international commerce.

ABOUT GTTL AND THE GTTL CERTIFICATE PROGRAM

Education in supply-chain management, product logistics, transportation, electronic commerce, intermodalism, infrastructure improvement, partnerships and strategic alliances is essential to understanding the emerging global economy. Since its inception in the summer of 1995, the Global Trade, Transportation and Logistics (GTTL) Program has addressed this need by training students in methods of today's global commerce and in the needs of public and private sector organizations. GTTL draws upon the expertise of faculty from 16 UW departments. These faculty work together with experts from business and government to provide instruction. None of the 16 departments, on its own, could have launched such a program because faculty interest in trade, transportation and logistics is often limited to only a few people in each department. Understandably, discipline-based departments are concerned with specific topics; systems integration of GTTL-related topics has gotten very little attention. When faculty and student interests across departments (Engineering, Communications, Economics, Environment, Geography, International Relations, Law, Marine Studies, Marketing, Operations, and others) are combined, a sizable education and outreach program results. The GTTL model, therefore, creates a "virtual department" by networking various faculty and students through the GTTL Certificate Program. GTTL's curriculum adds value to and enhances the student's existing graduate degree program.

Students taking GTTL 501/OPMGT 535 are eligible to enter the GTTL Certificate Program. This course is the first of two core course requirements for certification; the second is a seminar course offered in the spring quarter of 2005. Also required for certification are four electives, three of which may be taken in the student's home department. For more details on the GTTL Certificate, contact Greg Shelton at 616-5778.

REQUIRED MATERIALS

Business Logistics/Supply Chain Management," 5th Edition, by Ronald H. Ballou (Prentice Hall, 2004), available at the University Bookstore. Amazon.com also has new books.

GTTL 501 Course Packet, available at the Balmer Copy Center, Basement, Balmer Hall.

SUPPLEMENTAL BOOKS

Intermodal Freight Transportation, 4th Edition, by Gerhardt Muller, (Eno Transportation Foundation Inc, & Intermodal Association of North America, 1999) available at the University Bookstore.

A Review of Essentials of Accounting, by Robert Anthony and Leslie Pearlman (Prentice Hall), available at the University Bookstore.

COURSE WORK

Grading will be as follows:

20% Individual Class Attendance and Participation

20% Individual Homework Exercises

15% Exotic Extracts Game Team Performance

<Winners get cash awards $750, $500, $250>

20% Teammate peer evaluation of contribution

25% Final Case Write up

100% Total

CLASS SCHEDULE AND FILE DOWNLOADS OF CLASS MATERIALS

The class schedule is accessible via http://depts.washington.edu/gttl/501schedule.htm. PowerPoint, Word and data files shown on the next page that are underlined in the web-based syllabus and may be downloaded simply by clicking on them. (Some of these downloads are accessed directly from the GTTL website, while others are copyrighted and are available through library e-reserve.)

GTTL 501/OPMGT 535
Online Web Course Schedule

(Download Links are Underlined)

Date	Session	Topic (Including 501downloads)	Assignment (Including 501downloads)	Due	Background (Including 501downloads)
Oct 4	1	Intro to GTTL [Handout] Intro to Exotic Game (Incl. ERP: Agg. Plan, MPS, MRP, CRP, Financial Mgmt.) [Handout]	Read: Exotic Extracts (pp. 1 - 16) [Handout & email] Ballou (pp. 433-436) [email] Ballou (Ch. 1) [email]		
	2-Optional 5:00-6:00 Balmer 309	ERP: Financial Management [GTTL-2a]	Read: Ballou (Example on p.448)		Financial Workbook by Anthony
Oct 11	2	Workshop: Exotic Software [GTTL-2b], Forecasting lecture (Handout) <Bring Laptop if possible> Download: ERPSim.xls, FRC_Product 1.dat, FRC_Product 2.dat, Demand-Graphs.xls	Read: Finish Exotic Extracts [Handout & email] Read: Ballou (pp. 296-304) View Streamed Video – Forecasting (May need to download Real Player first)	ERP-Ballou (#1a on p. 463) (For details on specific technique, see Ballou pages 439-441)	View Streamed Video - Inv.& MRP (May need to download Real Player first) Logware Forecast Instructions [Ballou CD-Logware.doc]
Oct 18	3	Designing Integrated Logistics Systems Guest: Mike Bevers, Director of Logistics, Northwest Dairy Farmers (1 hr) Dell Case	Prepare: Interview with Michael Dell (see case& assignment sheet for questions-Packet) Ballou (Ch.2)	Exotic (Practice pd 7) Forecasting Exotic Products (see assignment)	Seeing the Future First (Lib res) E-Bus. and a Supply Chain (ch 14 Chopra- Lib res) GTTL-3c Dell in China
	3-Optional 9:00-10:00	Exotic Q&A [TA]			Financial Workbook by Anthony (see assignment sheet for details)
Oct 25	4 Greg	Why trade? What to consider when trading? [Handout] Session 4 slide presentation Transportation Surface & Marine Transport Guest: Tim Farrell, Asst. Direct., Port of Tacoma (1 hr) Transport Infrastructure (HUB Tapes)	Read: Minex Phosphate case (Greg's Handout) Read: Ballou pp. 164-189; discuss questions on p. 216 - # 2, 3, 4, 5, 6, 8, 12, 13, 14 Prepare: Port of Tacoma/Hyundai (see assignment sheet for case and questions-Packet) 502 Executive Summary (Greg's Handout) Recommended: Muller 345-356 (Greg's Handout)	Exotic (Real pd 7) Updating Exotic Forecasts	Ballou pp. 184-212 Glenn Pascall PSBJ Articles [GTTL-4b] 502 reports-Special Challenges [GTTL-4c]
Nov 1	5-Optional 5:00-6:00 Balmer 309	Marigold Game (PowerPoint presentation - missing) Download: Producer1.xls	Read: Marigold Game Instructions [GTTL-5a], [GTTL-5b], [Bring PC Laptop]		Bullwhip video
	5	Channel Coordination Marigold Wrap-up Barilla Case (Packet) Buffering against Uncertainty [1st-day Handout]	Prepare: Barilla Case (see assignment questions - Packet) Read: Ballou (pp.326-344, 355-357, 424-432, 436-442) Making Supply Meet Demand (Packet)	Exotic (pd 8)	Ballou (pp. 358-382) Coordination in a Supply Chain (ch 13 of Chopra - Lib res) Ballou (ch. 12)
Nov 8	6	Information Technology in a Supply Chain [GTTL-6a] Guest: Erik Hansen, shiplogix.com I2 Case	Prepare: I2 Case (see case & assignment questions - Packet) Prepare: Cisco case (handout) Read: Acquiring Exotic Logistics... (emailed on Nov. 7)	Exotic (pd 9) Pdct. Buffer-Ballou (#1, pp.391-392; #1b,p.468)	Information Technology in a Supply Chain (ch 12 of Chopra - Lib res)
		Exotic Distribution Workshop (Bring Laptop if possible)	Ballou (pp. 443-446)	DRP-Ballou (#3 on pp.464-465) (For method, see Ballou pp. 443-446)	Ballou (pp. 446-453)

Nov 15	7	Transportation Decisions (1 1/2 hours) Transportation Models [GTTL-7a] Download: RSEQ_TS Problem.dat & Tran_Problem 4.dat, RTR03.DAT] RFL_Problem 7-3.dat	Read: Ballou (pp. 219-239)	Transportion- Ballou (#1 - p. 255; #21 - pp.218) (for solution details, see Ballou pp. 220-222 and 295-209)	Ballou (ch 6; remainder of ch 7: pp. 220-254)
		Location Decisions (Infinite set & feasible set models) [GTTL-7b] (1 1/2 hours) Download: CodProblem 1eb.dat, Moca Problem 1d.dat	Read: Ballou (pp.550-569)	Exotic (practice pd 10--due Nov 13)	Ballou (569-596, 616-617)
	7-Optional 9:00-10:00	Exotic Q&A on Logistics Consolidation [TA]			
Nov 22	8 Greg	Transportation (cont') Special Transport Challenges in Northwest (FAST, etc.) Intermediaries, Marine Transportation Logistics for Disaster Relief Environment & Transportation (30 min)	Read: Muller Chapter 14 (Greg's Handout) Read: Betty's Brownies case (Greg's Handout) Read: LQ cases 1&2 (Greg's Handout) View: Fritz Flash Demo (look and listen) http://www.fritzinstitute.org/programs.html	Exotic (pd 10--due Nov 17) Transportion - Ballou (#3, 4 - p.256-257; #8, p.260-261; plus instructor's question -- see assignment in Packet)	The Shipbreakers access through [GTTL-6b]
Nov 29	9-Optional 5:00-6:00	Greg-Payment Terms, Documentation, Insurance & Logistics of Exports (1 hr) [HUB Room 209] Terms of Sale and Payment Plus Insurance			
	9	Lean Thinking Bummer Game (Phases 1&2) [HUB Room 200 a,b,c]	Read: pg. 1 of Bummer Game Manual (Packet) Read: The Lean Service Machine (Packet) Distribute Take-home Final	Exotic (pd 11) Facility Location- Ballou #1a, b, c on p. 597-598 + my assignment question	
Dec 6	10	Lean Thinking Bummer Game (Phases 3&4) [HUB Room 200 a,b,c]	Read: The Superefficient Company (Packet) Read: Your Lean Team: Use It or Lose It (Packet)	Exotic (pd 12)	From Lean Production to.. (Library)
Dec 16	Exam Period 8:30-10:20 p.m.	Bummer Wrap-up (15 minutes) [GTTL-10g (missing)] Exotic Wrapup (15 min) [GTTL-10h (missing)] Tom-Security in Commerce [GTTL-11a (missing)]	Submit: Final Case Writeup (Case and assignment questions distributed on 11/29) Read: 502 Security in Commerce Executive Summaries [GTTL-11b (missing)]	502 Student Reports (Security-Commerce) [GTTL-11c (missing)]	

Attachment 6 Continued
Core Svllabi

GTTL 502/OPMGT 536
Seminar in Global Trade, Transportation, and Logistics Studies
Reinventing Business, Government and Infrastructure to Embrace
Emerging Trade Partnerships with China and Other Asian Countries
GTTL Certificate Program: Core-II Course – Spring 2004

Seminar in Global Trade, Transportation, and Logistics (GTTL 502); SLN 4113; 4 Credits; Room 307 Balmer Hall, 4:30-6:20 p.m. MW. Team taught by faculty from across campus along with practitioners from organizations off campus. Dr. Tom Schmitt, Director of GTTL Studies, is the coordinating professor.

Objective: The Core-II Course is a topical interdisciplinary seminar that builds upon the students' previous experience and/or work at the graduate level in courses related to global trade, transportation, and logistics studies. The Core-I course or permission of the instructor is a prerequisite. This course brings together selected academics and practitioners (from agencies and industry) who have expertise in global trade, transportation, and logistics concepts, methods and operations. Emphasis this year will be on ***Reinventing Business, Government, and Infrastructure to Embrace Emerging Trade Partnerships with China and Other Asian Countries.*** The course uses a combination of readings, lectures, and discussions to explore a range of theoretical and meaningful issues. Each session includes an introductory lecture followed by discussion and interaction among students, faculty and practitioner guests. Along with this instruction, student teams research a topic or issue that is of special interest to various organizations in the public and/or private sector in the region. This research culminates in a paper and poster session to be presented at the final class session and to a student/faculty/practitioner audience at the GTTL Annual Conference on **June 2nd**

Course Readings

(March 29) **Introduction -** Syllabus, Readings, Conference, Resources

(March 31) **Trade Benefits** - William Center, Executive Director, Washington Council on International Trade

(Apr 5) **Student Group Formation**

(Apr 7) **Security in Commerce** (including Port Security Simulation) – Tom Schmitt

(Apr 12) **Export Controls and Nonproliferation** – Kevin Whattam, Program Director, PNNL

(Apr 14) **China Trade** – Joe Borich, Executive Director, Washington State Trade Relations

(Apr 19) **Reinventing Bus. & Infras.** – Barb Ivanov (WSDOT) and Dean Conti (President, Alpha Precision Machining)

(Apr 21) **Plant Closures while Sustaining Human Knowledge and Capital** – Professors Richard Schonberger, Karen Brown and Tom Schmitt

(Apr 26) **Surviving and Competing as a Business Unit within a Large Corporation** – Brian Hughey (Boeing manager)

(Apr 28) **Small IT Business Perspectives** – Allen VanBoven (Pres, ShipLogix) and Rowena Gates (VP, Aviarc)
DUE: One page proposal/abstract of team project

(May 3) **Port, Technology and Transportation Issues** – Tim Farrell, Assistant Director, Port of Tacoma

(May 5) **Outsourcing, Opening Markets and Government Regulation** – Steve Odom Director, Eddie Bauer

(May 10) **International Banking & Finance** – Barbara Mitchell, HSBC (aka The Trade Bank)

(May 17) **APEC Initiatives** – Jess Browning, GTTL Emeritus Professor, Monica Whaley, Executive Director, APEC

(May 19) **Worldwide Logistics Issues** - Song Chao, DHL China Manager

(May 24) **Disease proliferation** - Ann Marie Kimball Director, Asia Pacific Economic Cooperation Emerging Infections Network, UW Professor Epidemiology

(May 26) **Dry run of Student Presentations**

(June 2) **Executive Summary Presentations to Audience from Government and Industry at GTTL Annual Conference** - reception to follow

Attachment 7
Article on the Bummer Game

Red Bummer Dudes, Blue Bummer Dudes

By the final phase of the game, the two teams have completely reorganized their business processes, their members are working with newfound swiftness and efficiency, the mobile attack vehicles they're assembling are rolling down the test ramps with ease, and the money is pouring in. "Profit is a powerful incentive," explained manufacturing operations Professor **Tom Schmitt**, the co-creator—with operations research Professor **Bruce Faaland** and Mark McKay, a doctoral student in operations management—of the Bummer Game. "By phase three, the two teams have learned that even small operational details affect the bottom line. And they've seen their company's worth go from a loss of $1 million to a profit of nearly $1.5 million. That illustrates for them—better than any lecture could—what reengineering can do."

Faaland, Schmitt, and McKay designed the physical simulation game for use with the 35 to 40 Boeing managers who attend the School's three-week Aerospace Industry Manufacturing Seminar (AIMS), which is offered each February, July, and August. "Boeing's commercial and military operations are under intense competitive pressure to reduce costs and respond to customer demands," Schmitt said. "We wanted to develop a game that uses production processes and group dynamics to show players the financial consequences of their decisions as they occur. Mark found the perfect toy components at one of the local kid stores, and we hit on the idea of making 'Bummers,' a Boeing-version of the Hummer all-terrain vehicle. We played our first simulation last spring."

"If you can forget the sacred cows that are so prevalent in manufacturing and consider what may be radical changes," Schmitt said, "there's a dramatic potential for improvement. Reengineering isn't a synonym for downsizing."

To play, the Boeing managers are divided into two teams—the Red Bummer Dudes work for MAC Bummer and the Blue Bummer Dudes are employed by AIR Bummer—and given, in the first phase of the game, "a plant layout and material flow discipline that doom them to certain financial failure," said Faaland. And fail they do. After talking through their mistakes, which include weaknesses common to many real-world manufacturing settings, the teams redesign the layout of their plants, reassign tasks, adopt new leadership roles, and play the game again. The results are better in phase two, but profits are still nonexistent and the managers are eager to make further improvements to their production strategies and try it again.

Professor Tom Schmitt introduces a group of Boeing managers to the Bummer simulation.

"The Bummer Game is unique in that students build an actual product, based on an order from a real customer, who puts the delivered vehicle through a battery of tests before he accepts and pays for it," Faaland explained. "During the game, the financial performance figures are displayed prominently for all to see. The students have wide latitude to make changes, and they learn through discovery and experimentation."

And necessity. Boeing gave the UW faculty team the funding to develop the Bummer Game because the aerospace firm, like most major manufacturers, is looking for new ways to become more competitive. "If you can forget the sacred cows that are so prevalent in manufacturing and consider what may be radical changes," Schmitt said, "there's a dramatic potential for improvement. Reengineering isn't a synonym for downsizing. Reengineering simply means changing the status quo so that you don't miss out on the opportunities."

Attachment 8
Curriculum Vitae

THOMAS GLENN SCHMITT

Major career accomplishments and activities over the last 5 years

School of Business Administration
Box 353200, University of Washington
Seattle, WA 98195-3200
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glennsch@u.washington.edu

Global Trade, Transportation and Logistics
(GTTL) Program, Loew Hall, Room 313,
Box 352193, University of Washington
Seattle, WA 98195
http://depts.washington.edu/gttl

EDUCATION: DBA, CPIM

RECENT INDUSTRIAL EXPERIENCE

2003 Two week (April 6-12) study mission to Japan sponsored by Boeing and Shingijutsu Consulting. I traveled with 30 Boeing employees, including the Vice President of Fabrication and her five Directors. We visited two manufacturing plants per day across five Japanese cities.

ACADEMIC EXPERIENCE

2002-present Director of the Global Supply Chain Management Extension Program

1999-present Director of the Global Trade, Transportation and Logistics (GTTL) Interdisciplinary Graduate Program (see http://depts.washington.edu/gttl for details)

1984-present Tenured Associate Professor of Operations Management

COURSES OFFERED

1999-present Global Logistics Management at UW, Core I GTTL interdisciplinary graduate course.

1999-present Seminar in Global Trade, Transportation and Logistics at UW, Core II GTTL interdisciplinary graduate course.

1983-present Strategic Operations Management, Executive MBA Program at UW – Regional Option, and North America Option.

1980-present Manufacturing, Supply-chain and Product Development sessions in the Aerospace Industry Manufacturing Seminar (AIMS), a three-week seminar for Boeing Senior Managers.

RECENT STUDENT PROJECT SUPERVISION

2004 Sanjay Kumar's Dissertation (University of Texas, Dallas) – Committee Member

RECENT GRANTS

1999- Grants of $10,000 every year since 1999 from The Boeing Company for GTTL scholarships.

2004 Grant from Pacific Northwest National Laboratories of $25,000. Principal investigator, working with twelve GTTL graduate assistants during the period January 2003 to June 2005 on refining Non-proliferation Export Controls for underdeveloped and developing Asian countries.

2003 Grant from Sandia National Laboratories of $32,000. Principal investigator, working with three GTTL graduate assistants during the period December 2002 to June 2003 on Simulating Disruptions in Critical Infrastructure within Electronic Company Supply Chains in the Northwest.

REVIEW BOARD

2003 Editorial Review Board – *Operations Management Education Review* (OMER)

RECENT PUBLICATIONS

2005 "Conveying Cross-Functional New Product Development Concepts: The Payloads 9.8 Mars Lander Exercise" (with Carl Obermiller and Karen Brown), forthcoming, *Decision Sciences: Journal of Innovative Education*.

2005 "Scheduling Recurrent Construction," (with Bruce Faaland), *Naval Research Logistics*, forthcoming, Volume 51, 2004.

2004 "QUADRANT Corporation Applies Lean/JIT Concepts in a Project Environment," (with Karen Brown and Richard Schonberger), forthcoming-accepted May 2004, *Interfaces.*

2004 "Economic Lot Scheduling with Lost Sales and Setup Times," (with T. Arreola-Risa and Bruce Faaland), *IIE Transactions on Scheduling and Logistics*, Volume 36, Number 7, 2004.

2004 "Business Process Benchmarking" (with Karen Brown), forthcoming chapter in *Value Driven Operations Management* by Morgan Swink and Steve Melnyk.

2003 "Your Lean Team, Use it, or Lose it," (with Karen Brown and Richard Schonberger), *Target*, Volume 19, Number 1, 2003.

2001 "Duct Manufacturing Cases A, B & C," disguised case name for Boeing's Welded Duct Center in Auburn, *Technology Management: Text and International Cases*, edited by Norma Harrison and Daniel Samson, McGraw-Hill, July, 2001.

RECENT CONFERENCE PROCEEDINGS AND PRESENTATIONS

2004 "Simulating Disruptions in Supply Chains," with Kathryn Stecke (UT Dallas), Sanjay Kumar (UT Dallas) and Mark Ehlen (Sandia National Laboratories), *Decision Sciences Annual Conference*, November 2004, Boston.

2004 "Supply Chain Disruptions," with Kathryn Stecke, Sanjay Kumar and Mark Ehlen, *INFORMS Annual Conference*, October 2004, Denver.

2004 "A Longitudinal Study of a Plant Closure: Employee Responses and Performance," with Karen Brown and Richard Schonberger, Academy of Management Annual Conference, August 2004, New Orleans.

2003 "Simulating Disruptions in Critical Infrastructure," with Kathy Stecke and Mark Ehlen, *European Applied Business Research Conference*, June 9-13, 2003, Venice, Italy.

2002 "The Anatomy of a Plant Closure: A Longitudinal Study of Performance and Human Outcomes" (with Karen Brown and Richard Schonberger), Decision Sciences Institute, National Meeting, San Diego, November, 2002.

"Innovations in Distance Learning" (with Karen Brown-UW, and William Fischer and Robert Collins-IMD, Switzerland), Decision Sciences Institute, National Meeting, San Diego, November 2002.

2001 "Scheduling Recurrent Construction," Informs International Meeting, Maui, June 18, 2001.

PROFESSIONAL AFFILIATIONS

American Production and Inventory Control Society

Institute for Industrial Engineering

Council of Logistics Managers

Decision Sciences Institute

INFORMS

Pacific Northwest Economic Region (PNWER)

Gregory A. Shelton

PROFESSIONAL SUMMARY

More than twenty years of instructional, research, analytical and technical experience with emphasis on international intercultural communication, gained through work experience in large and small organizations in both public and private sectors.

QUALIFICATIONS

Teaching/Instruction/Guidance Skills

- Seven years of experience with academic advising, career counseling, recruiting, and lecturing at University of Washington Global trade, Transportation, and Logistics Studies Program.
- Five years experience teaching, lecturing, curriculum development, and counseling as language instructor in Japan.
- Lectured (including physics and physiology), wrote and administered exams, and taught in-water skills as SCUBA instructor.
- Advised international commercial aircrew members on operation, control, and troubleshooting of interactive in-flight entertainment system.
- Two years volunteering for Youth Guidance/Big Brother Program, advising, and mentoring underprivileged youth.
- Trained U.S. Air Force communications analysts on advising, translation and reporting procedures.
- As senior member, led exercises and provided examples to junior karate club members in Japan.

Communication Skills

- Five years experience teaching and making presentations before large and small groups in Japan.
- Twenty years experience effectively generating written communication: letters, reports, research projects and transcripts.
- Capable of conducting sensitive intercultural negotiations and interactions due to eight years living and working abroad.
- Conversational in Japanese, Arabic, and Spanish. Some knowledge of Greek, German, and Finnish.

Analytical/Research Skills

- Fluent with Excel, Word, Quicken, and Filemaker. Familiar with Powerpoint, WordPerfect, Netscape, and Access software.
- Able to gather, summarize, and synthesize data, as shown by three college degrees and a one-year graduate research internship.
- Capable of effectively gathering information from people by observation or interview.

Management Skills

- Adept with multiple facets of management: personnel, budgeting, planning, marketing, negotiating, inventory control.

EXPERIENCE

Assistant Director/Advisor/Lecturer, University of Washington, Global Trade, Transportation, and Logistics Studies. (1997-Present)

Avionics Systems Evaluator, Matsushita Avionics Systems, Inc., Bothell, Washington. (1997)

Administrator/Researcher/Facilitator, University of Washington, Seattle, Washington. (1997)

Freelance Language Instructor, Aomori Prefecture, Japan. (1993-1996)

International Liaison/Interpreter, Anyo Fisheries, Tokyo, Japan. (1993)

Graduate Research Intern, Port of Seattle, Trade and Business Development Department. Seattle, Washington. (1992-1993)

English Teacher, Municipal Board of Education, Takamatsu, Japan. (1988-1990)

Assistant Public Relations Coordinator, Burke Museum, Seattle, Washington. (1987-1988)

Youth Guidance Volunteer, Collier County Youth Guidance/Big Brother Program, Naples, Florida. (1983-1984)

Assistant Office Administrator/Sales Manager, International Investment and Business Exchange, Naples, Florida. (1982-1985)

Technical Translator, U.S. Air Force. (1977-1981)

Exchange Student, Speaker, Moderator, Interviewer and Recruiter. American Field Service. (1975-1976)

EDUCATION

University of Washington, School of Marine Affairs, Seattle, Washington.
Master of Marine Affairs. Specialized in Port and Marine Transportation Management. August 1997.

University of Washington, Henry M. Jackson School of International Studies.
Bachelor of Arts. Specialized in International Trade and Investment. December 1988.

State Fair Community College, Sedalia, Missouri.
Associate of Arts. General Education. May 1982.

EDUCATION (continued)

Defense Language Institute, Monterey, California.
1-Year Intensive Course. August 1978.

PUBLISHED WORK
"Maritime Nationalism and the Liner Shipping Market: Critical Choices for Developing Countries" Master's Thesis, University of Washington School of Marine Affairs, 1997

PROFESSIONAL AFFILIATIONS/MEMBERSHIPS

Cascadia Project/Discovery Institute

Chartered Institute of Transport and Logistics, North America

Intermodal Association of North America, Affiliate University Representative

Pacific Northwest Economic Region

The International Air Cargo Association, Affiliate University Representative

Transportation Club of Seattle

Washington Council on International Trade

Women's Transportation Seminar, Student Liaison, Puget Sound Chapter

PERSONAL INTERESTS
Transportation, SCUBA Diving, Bicycle Touring, Cross-country Skiing, Backpacking, International Travel, Foreign Languages.

Jesse Harrison Browning, Ph.D.
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BIOGRAPHICAL SKETCH
Major career accomplishments and activities over the last 5 years

Jess Browning is Director Emeritus of Global Trade, Transportation, and Logistics Studies (GTTL) and Affiliate Professor in Civil and Environmental Engineering at the University of Washington.

Jess has an MPA Degree from the University of Southern California in Los Angeles and a Ph.D. in Economic Geography from the University of Washington.

Over the past 5 years since stepping down as Director of GTTL, Jess has continued to serve the University of Washington in many outreach activities. At the local level, in Seattle, he is on the Freight Mobility Roundtable; he serves as advisor to the Puget Sound Regional Council's Regional Airport Strategic Plan; he has been Project Advisor to the Central Puget Sound Economic Development District's NEST Project, and was advisor to the Washington State Evaluation Committee for the FHWA Intermodal Freight Data Project.

At the national level he is on the National Academy of Sciences/National Research Council/Transportation Research Board's International Trade and Transportation Committee.

And at the international level Jess is a U.S. Delegate to the APEC Transportation Working Group and is the U.S. Representative to its Human Resources Development Steering Committee.

Jess has represented the University of Washington in helping to establish the Global U7 Consortium of Universities to do joint research and education in the fields of business, information technologies, logistics, and marine affairs. In doing so he has participated in two steering committee meetings, an education committee meeting, a research committee meeting and workshop, as well as standing in for our University's President at a signing ceremony in Korea to establish the Global U7 Consortium.

He lectures and guides graduate students research at the University of Washington relating to international trade, logistics, transportation, and regional economic development. He has and continues to serve on graduate students committees.

Recent publications include "Japanese Port Management Systems in Deregulation: A Comparative Study of Management Methods (Construction, Control, and Operation) in U.S. and Japan Container Ports." The study was funded by the Nippon Foundation report and has been published in both English and Japanese, (Bollard Nippon), March 2000.

Another recent publication is “Development of Logistics and Transportation Systems in Promoting Trade & Economic Growth: Comparing Incheon and Seattle Areas,” Korean Observer, Vol. 34, No. 3 Autumn 2003. Most recent work are “Logistics of Container Transport in the Yangtze & Yellow Sea Regions,” Journal of Logistics and International Trade, Volume 1, No. 1, December 2003 and Short Sea Shipping and Innovations for Intermodal Container Logistics in Northeast Asia, Jess Browning and Seung-Hee Lee. Journal of Logistics and International Trade, Volume 1, No. 2, August 2004.

Jess is often invited to give talks and lectures on topics related to trade, transportation, and logistics. He has spoken to the China Association of Mayor’s gathering at an International Forum in Beijing on “The Role of Logistics and Related Services in Promoting Urban Economic Development” and gave the address at the Washington State Department of Transportation’s Workshop on “Freight Action Strategy for Seattle and Tacoma.” He has recently given several lectures at Xiamen University in China and at Inha University in Korea as well as participating in workshops.

He is a former entrepreneur and founder of a manufacturing business in Los Angeles, California producing various types of material handling systems with exports to East and South East Asia for 17 years before selling in 1987 and returning to the University of Washington. He has eight patents relating to environmental controls, conveyors, and computers and is listed in Marquis' Who's Who in America and Who's Who in World."

Jess is married and lives with his wife Vicki on Bainbridge Island in Washington State near Seattle. They have 4 daughters and 10 grandchildren (6 boys and 4 girls).

Christopher Fidler
Major career accomplishments and activities

University of Washington Business School
Marketing and International Business Department
Box 353200 98195
Phone: 206-543-4369
Fax: 206-543-7472
Email: chris@cfidler.com

Lecturer of International Business

MS, Georgetown University, 1985
Certificate of Languages, Geothe Institute, Bremen, Germany (1985)
BA, Saint Martin's College, 1982

Specialties

International trade operations

Positions Held

At the University of Washington since 2000
Director of Government Affairs at Airborne Express (1994-present)
Government Affairs Manager, Airborne Express (1994-97)
Executive Vice President and General Manager, WRG Corporation (1992-94)
Vice President for Military Sales, WRG Corporation (1990-92)
Contract Administrator, WRG Corporation (1987-90)
U.S. Consulate General, Vancouver, B.C. (1985-87)

Honors and Awards

Washington World Affairs Fellow (1986)

Service

Currently:
Board of Trustees, World Affairs Council
Chair, Washington District Export Council
Board of Directors, Cargo Airline Association
Aviation security, cargo facilitation and government affairs, Air Transport Association