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## Closing the Gap: Developing a Transportation Curriculum for the Oregon Young Scholars Program: Project Summary Report

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# **Closing the Gap: Developing a Transportation Curriculum for the Oregon Young Scholars Program**

**OTREC-ED-13-02**

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Additional information about this project, including associated project deliverables, can be found at <http://otrec.us/project/97>



## **ABOUT THIS PROJECT SUMMARY REPORT**

The purpose of an OTREC Technology Transfer (T2) project is to leverage existing research or knowledge for the direct benefit of transportation practitioners and users. In most cases, the result of a T2 project is a handbook, workshop or other standalone deliverable. The purpose of this project summary report is to document the project's methodology and outcomes. The deliverables may be included directly or by reference but will always be readily available on the project's webpage at <http://otrec.us>.

We expect that this report will be primarily of value to researchers who may be considering a project to replicate or adapt, or who want to apply the lessons learned through the way this report was conducted rather than use its results. We encourage you to contact the principal investigator or OTREC staff for further information.

## **ACKNOWLEDGEMENTS**

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# **CLOSING THE GAP: DEVELOPING A TRANSPORTATION CURRICULUM FOR THE OREGON YOUNG SCHOLARS PROGRAM**

## **PROJECT SUMMARY REPORT**

OTREC Project No. 2008-97  
Principal Investigator: Carla Gary  
University Affiliation: University of Oregon  
Project Website: <http://otrec.us/project/97>

### **INTRODUCTION**

This project summary report describes the execution of OTREC Project #97 (Closing the Gap: Developing a Transportation Curriculum for the Oregon Young Scholars Program). With OTREC's support, the University of Oregon's summer enrichment program for youth was able in 2008 to focus on many facets of transportation, including workforce opportunities.

### **OREGON YOUNG SCHOLARS PROGRAM: BACKGROUND**

Oregon Young Scholars Program (OYSP) is an academic pipeline initiative created by the University of Oregon's Office of Institutional Equity and Diversity to "grow prospective college students" who will be future scholars, teachers and civic, business and community leaders. It was developed in 2005 to nurture the potential of marginalized, minority and low-income students, to prepare these students for higher education, and to increase the awareness of their parents or caregivers about what it will take for these students to achieve at higher education institutions. Importantly, it was an opportunity to introduce them to careers with which they were either marginally or not at all familiar, but which had great impact on the quality of life in their communities.

Young Scholars are chosen from the 8th-grade classes of several schools in Portland and Eugene-Springfield that serve students who are most underserved in higher education. OYSP focuses on providing this opportunity to students of color, students from homes with limited incomes, and students who are the first in their families to be college bound. The program began in 2005 with rising freshman. Because scholars return in subsequent summers, 2008 was the first year that students from all four grades (9<sup>th</sup>-12<sup>th</sup>) participated together, with more than 40 students in all.

Each summer, the program features an on-campus intensive "camp" of seven to 11 days where Young Scholars attend morning academic sessions focused on math and writing, the two basic components of any education. In the afternoon, they are grouped into smaller academic cohorts

including business and finance; community planning and design; chemistry; urban planning and policy; public health policy; arts and culture; environmental sociology; and law (not all cohorts are offered every year).

## OYSP'S TRANSPORTATION THEME IN 2008

In 2008, OYSP proposed to employ transportation as a theme. The theme provides students with the opportunity to consider the challenge facing transportation and other industries: to bridge the gap between those who participate in the field and those who are not so involved, from engineering to planning and public policy. It speaks loudly to the necessity of engaging diverse perspectives and voices into every aspect of the industry, as reflected by OYSP's different cohorts.

Each cohort examines a relevant facet of transportation, as illustrated in the table below. For example, the *chemistry cohort's* focus was to consider the chemistry of alternative fuels and the power derived versus the power needed to create the fuels. The *public policy cohort* looked at the public health implications of transportation choices.

<b>Cohort</b>	<b>Transportation Focus</b>
Business	Availability of public transportation/ease of access to businesses and the impact of transportation on these businesses.
Chemistry	Development of renewable energy technologies for transportation.
Health Policy	Analysis of health outcomes based on residential demographics, mobility concerns and access to health care.
Urban Planning	Consideration of public input in transportation planning, especially with underserved communities.
Arts & Culture	Analysis of diverse stakeholders as artisans and consumers, and the improvement of public spaces via art.
Environmental Sociology	Consideration of proposed changes to community infrastructure and small businesses, particularly, How will they affect the community's economics? What is the impact on the environment? What are the sustainability issues related through citizen interviews around the city.

### Program Activities

OYSP sought to give participants a hands-on understanding of transportation through community service activities and field trips. Students in the *arts and culture cohort* took bike rides through the city and analyzed the infrastructure from a youth perspective, and talked with personnel in the City of Eugene Public Works and Planning departments about their careers. They discussed the role of public art at bus stations and issues related to community involvement.

An OYSP tradition is for the Young Scholars to host a business networking dinner at which they learn how to present themselves professionally and network with professionals, including university faculty, staff and students as well as business people and community members. One goal of the dinner was for the students to learn the different careers paths available for entering the transportation industry.

In 2008, the dinner's keynote speaker was Mark Pangborn, general manager of the Lane Transit District. Pangborn shared his path to the transportation field, and discussed the many career opportunities and the impact of transportation on quality of life issues for every community.

Other "community mentors" at the dinner included:

- A board member of the Eugene Cultural Policy Board
- Lane Transit District's public artist
- Lane Transit District's architect for station stops on its new bus rapid transit line, EmX
- From the City of Eugene, a natural resources planner and a neighborhood planner
- Local business people
- Community leaders and other community members

The summer program culminated in a one-day charrette focusing on a transportation issue in the City of Eugene: the selection and development of a new bus rapid transit route to serve the region. In consultation with transportation professionals and community leaders, the Young Scholars picked this topic for the charrette because of its potential to engage community members in an important local decision.

As a planning tool, charrettes require creativity and collaboration. As an integrated educational approach, the charrette facilitated exploration of public transportation from diverse perspectives and encouraged students to creatively involve themselves in the field.

Through participating in the charrette, students in each cohort culminated their week of investigation. With help from the faculty facilitator and technical expert, they discussed the pros and cons of each of the routes from their cohort perspective. Instead of merely theorizing about what others may think, they learned to incorporate different perspectives, prioritize tradeoffs, and better understand the process of community building. By having representatives from Lane Transit District (LTD) present, the students were able to provide recommendations to an actual community project. LTD subsequently adopted the same route agreed upon by the Young Scholars.

## **OUTCOMES**

Every year, OYSP seeks to increase academic skills, interest in college and support among families and teachers. In 2008, the transportation theme provided an effective medium through which to accomplish these goals. The charrette exercise, in particular, fulfilled the program's desire to strengthen the students' leadership skills.

The future of transportation does indeed lie in the hands of those with whom we must identify, encourage, prepare and support in facing myriad challenges. We are confident that the Oregon Young Scholars Program is a model that can help meet this need for both the industry and our nation.

The following are specific outcomes of OYSP's 2008 transportation-focused experience:

- All of the students in the program were immersed in transportation topics and activities throughout the week.



- The 10 college-aged assistant/mentors were also immersed in the programmatic activities and information.
- Direct involvement with the topic will hopefully inspire both the students and the assistant/mentors to pursue transportation-related classes at the university and consider it for a career.
- Each student undertook a cohort intensive in one of the five cohort areas (planning and design, business, public health, art, and environmental sociology) and was expected to bring that particular discipline's perspective to the community workshop.
- Students effectively engaged in a community decision-making process.
- Students successfully identified the pros and cons of alternate EmX route options.
- Students engaged in constructive debate on different options.
- Students achieved mild consensus on best strategies for LTD as it moves forward in its EmX planning process.
- LTD learned about the valuable resource that youth bring to planning processes.
- LTD learned that many of the issues/concerns expressed by adult residents are shared by youth.
- LTD learned that youth bring different perspectives as well.
- LTD learned that youth are capable of thoughtful engagement and debate around challenging issues.
- LTD learned that working with a program like the Oregon Young Scholars Program can help to foster interest in transportation issues among youth.

## APPENDIX: OYSP TRANSPORTATION CURRICULUM

OYSP employs four educational strategies as the structure of its annual summer program:

**(1) Residential 11-day program:** Many of the students that attend this program come from stressful home environments. The 11-day residential program provides them an opportunity to discover new ideas in a stimulating and safe environment where their main task is to learn and expand their mind. By living together, students develop communication skills needed to negotiate program-related team projects. Moreover, they are exposed to all the resources on a university campus, from the library to classrooms, dormitories and professors.

**(2) Multidisciplinary curriculum:** One topic (transportation) and five disciplines (public policy, chemistry and environmental sociology, business, planning and design, and art) create a laboratory for a multidisciplinary curriculum. This integrated approach does not dissect issues into discrete topics; rather it utilizes the system-thinking philosophy to show linkages. This type of learning is especially useful for high-school students who are developing synthesis and integration skills.

**(3) Age-group mixing/peer teaching:** A service-learning axiom is to *learn by doing*; and studies have shown that *learning by teaching* is even more effective. Students from each of the grade levels are mixed into each of the five academic cohorts. This way, older students assist the younger students with homework, behavior and critical thinking. We expect the older students to model appropriate behavior and lead discussions.

**(4) Service Learning:** Service learning lies at the heart of this project and forms the core of the methodology. Service learning is a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development. Reflection and reciprocity are key elements of service learning. This type of learning differs from the traditional academic model of classroom teaching with an emphasis on theory. Both types of learning provide students with a well-rounded experience and are needed within the education process.

For 2008, when OYSP focused on the transportation theme, the program adopted three principal objectives:

**(1) Increase the number of minority transportation policy and planning professionals.** Historically, the number of minority students pursuing careers in transportation policy and planning has been limited. Engaging these students and providing avenues for their participation early on can address this underrepresentation of minorities in the field. OYSP will immerse students in the subject and support continued learning opportunities for those students who express interest.

**(2) Expose young people to holistic transportation issues to increase their understanding of how individual choices impact themselves, their community and the environment.** OYSP's integrated curriculum blends planning and design, business, art, public health and environmental sociology. This approach encourages students to "connect the dots" and helps them to better

understand how the individual, the community and the environment all impact one another. OYSP's methodology allows students to undertake a detailed, proximate analysis of a specific community transportation challenge. At the same time, the program will provide a broader context through which students can learn the importance of holistic transportation planning to foster safe, healthy, attractive and sustainable communities.

### **(3) Promote youth-adult partnerships to solve community-based transportation issues.**

Similar to the need for a holistic approach toward community-based transportation planning, the net must be cast wider regarding the voices that are at the planning table. Promoting youth-adult partnerships provides mutual benefit. Youth are an essential component of any community with important assets to share, including creative problem-solving, energy and time. Adults manage knowledge and resources and are instrumentally important in engaging youth participation. OYSP cultivates opportunities for adult-youth partnerships throughout the program.

Furthermore, the program adopted six learning objectives to guide each cohort's curriculum:

1. Understand the tradeoffs that communities face when citing public transportation.
2. Participate in a community decision-making process.
3. Identify competing priorities, research costs and benefits of competing strategies and make an informed recommendation – individually and as part of a group.
4. Increase knowledge in one of the five cohort areas (business, art, public health, planning and design, and environmental sociology) with respect to public transportation.
5. Develop mathematical skills to aid in their understanding of the design problem, and improve writing skills to help them communicate their ideas.
6. Experience interdisciplinary learning and develop a stronger appreciation for the inter-connectivity of public planning processes.

## **FRAMEWORK/CURRICULUM**

### **Presentation of the Design Problem**

On the first day of the academic week, the director of the EmX extension project spoke to OYSP students about the issue and asked them for their perspectives. This provided the kickoff for the week. The students would work all week and then present their ideas to the Lane Transit District (LTD) on Friday.

### **Cohorts**

All cohorts (business, art, public health, planning and design, and environmental sociology) focused on the design questions as it related to the cohort. Within the cohorts, students took field trips, talked with guest speakers, and had class discussions. (See individual cohort curriculum.) The detailed curricula from four of the cohorts are exhibited on pages 10-11.

### **Charrette**

The program culminated in a half-day charrette focusing on the EmX topic. Students worked in interdisciplinary teams to discuss the tradeoffs that the LTD will face when choosing a route. The students were divided into six small groups (each staffed by OYSP faculty, a technical expert and a residential assistant) and directed to:

1. Identify pros and cons of each potential route,
2. Select the route your group would propose for each segment, and;
3. Discuss what station design should look like.

Each group was supported by one OYSP faculty, a technical expert and a residential assistant. The OYSP faculty was responsible for helping to facilitate the group, using the sample questions below as prompts.

1. Will the neighbors like it? Will the businesses like it?
2. Will it change the character of the area?
3. Origins and destinations – where do people want to go on the bus?
4. Do people feel safe accessing the bus?
5. How does this route help LTD achieve the objectives of the West Eugene EmX
6. What impact would this route have on air pollution? Is it likely to significantly reduce emissions?
7. What kind of impact would this route have on safety? Would there be fewer auto/pedestrian/bike accidents?
8. What are the costs for this route? Based on today's dollars of 6 million per mile
9. Is this route likely to increase physical activity? Would more people bike or walk (in combination with using BRT)?
10. Is there room for it, or will LTD have to buy land? Are there power poles?
11. What forms of transportation are safe for the environment?
12. Is the new bus line a necessity?
13. Are biofuels a sustainable alternative to fossil fuels for EMX?
14. Will people use it?
15. Is expanding EMX out West 11th encouraging the city to be more livable or more spread out (sprawled)?
16. If we continue to use gasoline, what will happen to our earth?
17. How will LTD handle the increasing price of gas, how will this affect people, and which people will it affect the worst?
18. If LTD gets public funds, should they be profit driven?
19. What do people from the community think?
20. What will the impact on the businesses be along the route?

*Curriculum Plan for the 2008 OYSP Planning and Design Cohort*

**Learning Objective:** In preparation for the student's participation in a design charrette, students will: (1) provide pros and cons of each proposed LTD route from a community planning perspective; and (2) create scaled models of bus stops along the route.

**Processes/Instruction to Achieve Objectives:** To be able to articulate these pros and cons, the students must understand the impacts of these routes on various community components, such as neighborhoods, natural resources, businesses and aesthetics. Furthermore, through creating a model of a bus stop, students will better understand the considerations that go into station design.

**Final Deliverable:** The Planning and Design students were divided among the various groups for the charrette and argued from a community planning perspective about the tradeoffs of the different routes. During the charrette, groups listed what they would like to see in a bus stop. Having built a model of a bus stop, students in this cohort contributed many ideas to the list.

*Curriculum Plan for the 2008 OYSP Art Cohort*

**Objective:** In preparation for the charrette, students will research the role of design and public art in mass-transit settings and prepare recommendations for the proposed LTD routes.

**Process/Instruction to Achieve Objectives:** To be knowledgeable and able to discuss the role of design and public art, students will research the topic of cultural policy and meet with professionals to learn more about how design communicates information. They also will learn how and why public art has been integrated in transportation in both Portland and the Eugene/Springfield areas.

**Final Deliverable:** Students from the art cohort were divided among the other students for the charrette. They were advocating for the need for visual communications, EMX branding continuity, and public art that would reflect the local station community. They also discussed the impact on cultural services access with each route.

*Curriculum Plan for the 2008 OYSP Business Cohort*

**Learning Objective:** In preparation for participation in a charrette, students will provide pros and cons of each proposed LTD route from a business perspective and from the affected businesses along the differing routes.

**Processes/Instruction to Achieve Objectives:** To be able to articulate these pros and cons, the students must understand the impacts of these routes on the businesses and LTD; the length and costs of each route; and what impact the proposed EmX route will have on overall LTD operations.

**Final Deliverable:** The business cohort students were divided among the various groups for the charrette and argued from a perspective that included LTD as a business and business impacted by the proposed routes what routes LTD should take for each segment. See "Context" and "Final

Deliverable” documents. Their written essays and T charts provided them with a framework to use in articulating the facts and impacts.

*Curriculum Plan for the 2008 OYSP Environmental Sociology Cohort*

**Learning Objective:** In preparation for the participation in a charrette, students will provide pros and cons of each proposed LTD route from the perspective of environmental sociology, which is the effects that human interactions have on our physical environment and vice versa.

**Processes/Instruction to achieve objectives:** In order to serve Eugene residents most beneficially, students will be able to discuss the following transportation issues: Why is it necessary? Why does it take its present (predominantly motorized) form? Who gets to decide on such matters? What are the economic, ecological and environmental factors for implementing any such system, as well its long-term sustainability? Given the detrimental effects that motorized forms of transport have on the environment (pollution, resource depletion etc.), how will we continue to sustain motorized forms of transport? What are the disadvantages to current trends? Bio-fuels: How much do they cost (humanitarian, ecological, etc.)? And, finally, what are the alternatives?

**Final Deliverable:** The environmental sociology students will be divided among the various groups for the charrette and will inform the conversation with the knowledge gathered from their field surveys of randomly chosen candidates in various places in the Eugene community. They will share the responses to their questions regarding expressed preferences for the proposed bus routes gleaned during their interview, with the concerns noted around environment and sustainability issues as well.



## **APPENDIX : TESTIMONY**

OYSP received the following messages of support following the 2008 summer session.

*Marc Schlossberg, Professor of Public Policy, Planning and Management, University of Oregon.*

OYSP is a very unique approach towards meeting the future transportation needs of a nation and increasing the diversity of professionals within the field. OYSP is a very unique approach toward meeting the future transportation needs of the nation and in increasing the diversity of professionals within the field. By targeting students while early in high school and introducing them to college life, OYSP seems to be a unique and meaningful way to get these kids thinking about college in ways that they may not otherwise have done.

Using transportation as a focus of their work while on campus during their summers also makes great sense, as it connects with so many disciplines of study relevant to the transportation field including city planning, public policy, business, economics, chemistry, geography, and political science among other fields.

I guess what I like most about OYSP is that the program intertwines the notion of diversity of these young scholars with a diversity of what the transportation field is all about. Their work this past summer in working with the local transit agency to plan out potential future routes for our Bus Rapid transit System displayed all the best qualities when you challenge young people, provide University resources and mentorship, and connect the learning to an applied community project that affects the future sustainability of the region. To me, OYSP is a one of a kind approach to increase the diversity of transportation professionals while providing true opportunity and ownership to young people who may not otherwise see a college education as part of their future.

I am thrilled that OTREC has seen the progressiveness of the OYSP approach and has supported its work. I'm hopeful that the model of using transportation themes as a hook to engage young people into a future of scholarship and good work is one that is replicated elsewhere in the nation. The University of Oregon has shown great leadership in its support of this innovative program and on-going OTREC support will hopefully keep things moving forward.

*Mark Pangborn, General Manager, Lane Transit District*

LTD was thrilled by the opportunity to work with the youth of the Oregon Young Scholars Program. The future is going to bring dramatic changes to transportation alternatives and modes. The price and availability of fuel, carbon taxes or caps, and the gray tsunami that the aging of America will bring will have a profound impact on the transportation needs of our communities.

I cannot think of a higher priority than the education of our youth to the challenges they will soon be facing. Changes, such as the aging of the baby boomers, continued in-migration from abroad and internal migration to follow jobs will demand new solutions. It is imperative that the future workers and leaders of America, our youth, obtain a firsthand knowledge of the challenges they will be facing, and there is no better way to do this than the experiential learning process that OYSP provided.

These are the people that will have to revise our national transportation policies and priorities to accommodate the rapidly changing demographics of our society. I know by the questions these



OYSP youth were asking that the opportunity they had to experience learning from practicing professionals and to do transit research, will prepare them to respond to these future challenges. (unpublished data)

In addition to trying to recruit for a broader range of disciplines, State Departments of Transportation (SDOTs) also face the challenge of an aging work force. About 50% of the SDOTs work force will be eligible to retire within the next 10 years, leaving many vacant positions to be filled. The pool of prospective employees is more diverse than ever, and SDOTs must think of ways to recruit and retain a workforce that will reflect demographic trends.