

# TRIPLE BOTTOM LINE EVALUATION OFFEDERAL LAND FROM A CIVIL AND ENVIRONMENTAL ENGINEERING

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**ABSTRACT**-This paper presents a description about an innovative tutoring method for coordinating a multiple participant in a viable study in an upper division technical communication course for engineers. Centered on a Utah Legislature-commissioned report on the feasibility of a federal land transfer to Utah state governance, this investigation demonstrates how to guide students through the research, analysis, and consensus building stages of writing a technical report while coordinating student research on current engineering challenges. This paper uses the triple bottom line and the Delphi technique and provides comprehensive and systematic engineering and technical communication framework for organizing research questions. This study propose answer to the questions to the questions like What significant benefits and consequences would a federal land transfer entail for civil engineers and how are engineering students best taught to research such topics. Thus help student to learn infrastructure and land planning while learning about the new problem.

**KEYWORDS**-triple bottom line, civil engineering, federal land transfer, land use planning

**INTRODUCTION-CASE STUDY OF PUBLIC LAND**-In 2014, the Utah Legislature commissioned a report titled An Analysis of a Transfer of Federal Lands to the State of Utah[1]. In this study the viability of the federal land transfers to the state. In this study the details the systematic method to aid engineering students in researching such issues while producing quantifiable assessment results. These studies also demonstrate the method to identify the issues of local concern. By foregrounding the social and environmental aspects of an infrastructure or land transfer project to ensure that these are not acquiescent to a project, this approach is useful for leading students through the research process. This paper addresses two research questions (RQs) as follows:

Q1: How are engineering student's should be best taught to research expansive, relevant, and pressing infrastructure and/or land planning topics that will directly affect them as they professionalize?

Q2: What safeguards or constraints can be introduce within a course that ensures students are exposed to the various problems of infrastructure and land transfer?

**COURSE BACKGROUND AND THE FEASIBILITY REPORT**-This course produced the result of an iterative process that occurred over three semesters. Prior iterations examined more

discrete infrastructure topics, including a proposed crude oil pipeline that would connect drilling operations in the Uinta Basin, Utah to area refineries in North Salt Lake City, Utah as well as the proposed Blue Castle nuclear energy project on the Green River in Utah. During this timeframe, the instructor has made numerous incremental revisions to the structure, aims, learning objectives of the course and the project described herein.

**METHODOLOGY**-In this paper Triple Bottom Line (TBL) and Delphi Technique are used. Initially, the triple bottom line (TBL) concept is used to conduct the analysis portion of the study followed by Delphi technique in the conclusion section of individual chapters to generate a quantified assessment score.

1. Triple Bottom Line-TBL considers three aspects of land use planning: People, Planet and Profit. These criteria, also referred to as the 3Ps, it attempts to strike a balance between the social (people), environmental (planet), and economic (profit) dimensions of land development projects while providing a clear set of standards to evaluate the long-term health of a given community or ecosystem. TBL methodology exploits the “features of the assessment process, multi-criteria analysis, input from technical experts as well as non-technical stakeholders[2].

Today, TBL has been applied many engineering topics ranging from urban infrastructure [2] to water supply planning [3].

2. The Delphi technique, or feedback process, occurs as a series of questionnaires in which participants are asked, among other issues, to make textual revision on the scope, find the strength of specific elements and offer an account of the overall focus and tenor of participants’ research findings. Delphi process works well for a classroom setting because it provides students inconspicuousness, a controlled feedback process free of noise and distortion, and the suitability of a variety of statistical analysis techniques to interpret the data.

**EXPLANATION OF ASSESSMENT CRITERIA USED IN FEASIBILITY STUDY** -In these study students were asked to complete assessment criteria to evaluate their topic. Table 1 depicts the individual interest of the students in the land transfer issue. Those scores were averaged to conclude the outcome of the class. Each team was to rank three categories that their chapter emphasizes i.e. (people, plant, and profit). Then scoring were done based on the common criteria

where 1=Extremely Detrimental and 7=Extremely Beneficial whereas 0=Abstention.

Triple Bottom Line Criteria			Triple Bottom Line Criteria			
People	Planet	Profit	Individual Chapters	People	Planet	Profit
Land Access	Water Quality	Revenue Generation	1	4.3	2.7	4.3
Human Health (Effects on)	Air Quality	Oil & Gas Royalties	2	3	3.1	5.7
Recreation	Wildlife Management	Livelihood/ Jobs	3	3.3	3	4.3
Jobs	Environment Quality (Overall)	Land Usage/ Development	4	3	3.3	6
Trust of Local Government	Mining (Effects of)	Land Sales	5	4.5	5.1	5.3
			6	4.3	2.6	5.5
			7	6	4	4
<b>Final Score</b>	<b>Final Score</b>	<b>Final Score</b>	<b>Final Score</b>	<b>4.06</b>	<b>3.40</b>	<b>5.01</b>

The final row of the table in the People category receives a total score of 3.92 (average of the criteria scores in a given column). This process is repeated for the following two remaining categories. The feasibility report average assessment score for the Profit category is 5.01 (Somewhat Beneficial). Planet dimension of a public land transfer, a final assessment score of 3.4 (Somewhat Detrimental) is significant given that engineering students tend to be boosters of many infrastructure development proposals as well as natural resource extraction efforts. People Category ranked 4.06 (Undecided).

**CONCLUSION-**In this paper student research constitutes an important and underutilized aspect of civic engagement since it is not motivated by (overt) political or industry pressures. Students participating in this type of research should be encouraged for their efforts at understanding and contributing to the shape our collective future. In this we use the assessment mythology which acts as a serious effort by undergraduates to combine technical writing method with the level of expertise required of civil and environmental engineers.

## REFERENCES-

- [1] R. B. Keiter and J. Ruple, "A Legal Analysis of the Transfer of Public Lands Movement," *SSRN Electron. J.*, 2014.
- [2] S. P. Vargas and S. Kharaghani, "The South Los Angeles Wetland Park - Achieving the triple bottom line - A new paradigm in sustainable public Urban infrastructure," in *ICSI 2014: Creating Infrastructure for a Sustainable World - Proceedings of the 2014 International Conference on Sustainable Infrastructure*, 2014.
- [3] R. S. Griffith and R. A. Ickert, "Sustainable Water Supply Planning for North Central Texas: Using a Decision-Support System to Evaluate the Triple Bottom Line," 2014.

