INTRODUCTION

Research Objectives

1. Characterize the nature of the energy industry in southwest Manitoba, including locations of major oil fields and destinations, and prospects for future growth
2. Identify the transportation system that currently meets industry demands, including the infrastructure (highway, rail, and pipeline networks), vehicles (trucks, trains), and relevant regulations
3. Assess the impacts on and needs of regional infrastructure

Background

- Manitoba has experienced considerable growth in the energy sector since 2006 due to technological changes in the petroleum extraction process and identification of new oil reserves
- Rapid increase in active wells and wells drilled per year
- Jurisdictions across North America are beginning to consider the impacts of the energy sector in long-range transportation plans

Planning for the transportation needs of the energy sector is challenging due to its multifaceted nature:
- Development along low-volume secondary highways
- Railroads are upgrading previously low-volume routes and adding transload facilities
- Limited pipeline capacity has resulted in increased rail traffic for crude oil
- Well development requires many inputs and both origin and destinations are dynamic

Method to Characterize the Activity and Infrastructure Systems

- Development of a geographic information system (GIS) that incorporates data elements of the activity and transportation system

Vehicles

- Well development and production has multiple stages with wells serving as origins and destinations
- Well-specific activity leads to substantial truck traffic during the drilling phase and continued truck traffic throughout its production life
- Major origin are material sourcing sites such as rail transload facilities bringing frac sand and supplies and sources of freshwater
- To develop a single well in North Dakota typically requires over 1000 loaded truck trips
- Volumes are expected to be lower in Manitoba due to differences in geological formations

ACKNOWLEDGEMENTS

- Natural Sciences and Engineering Research Council of Canada
- Manitoba Innovation, Energy, and Mines – Petroleum Branch

CONCLUSIONS

- Improved knowledge of the energy sector can assist in developing effective transportation plans
- Development of a geographic information system (GIS) provides a useful analytical and mapping tool to support engineering and policy decisions
- Oil well development is a year-round activity that can be impeded by spring weight restrictions, particularly along secondary highways and roads
- A multimodal approach is necessary for developing transportation plans for the energy sector as each mode plays a significant role in the movement of inputs and outputs
- Accurate, up-to-date datasets are necessary when investigating the impacts of the energy sector as origins and destinations (primarily oil wells) are dynamic and active regions may only remain active for short periods of time