

Production of Cellulosic Ethanol from Mixed Paper
(Technical Report)

The Contested Future of Autonomous Vehicles in the US
(STS Research Paper)

An Undergraduate Thesis Portfolio
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by

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Preface

How can the efficiency and sustainability of the United States transportation system be improved? Proposals to improve sustainability include conversion to electric-drive vehicles (EVs) and foregoing car dependency in favor of public transportation, cycling, and walking. These visions are sometimes incompatible with each other; in such cases, we must choose one to the exclusion of the others.

Biofuels, including cellulosic ethanol and biodiesel, may offer more sustainable alternatives to petroleum fuels. Most current production of cellulosic ethanol uses corn stover or food byproducts as a sugar source; to avoid competition with the food industry and to take advantage of a currently unused sugar source, ethanol is produced from a mixed paper feedstock using hydrolysis, fermentation, distillation, and molecular sieving. An economic analysis of the plant design indicates it is [not] profitable as currently described; the price of ethanol produced could not compete with current gasoline prices. Opportunities for additional income include recovery and sale of byproducts, reduction of water demands, and increased energy efficiency.

Interest groups are competing to influence the future of surface transportation in the United States. Proponents of autonomous vehicles (AVs), include tech companies and automakers, which seek regulations favorable to AVs from the U.S. Department of Transportation and the National Highway and Traffic Safety Administration. Opponents, including sustainability advocates, work to make cities more pedestrian friendly by promoting bicycles and scooters for transportation. Opponent groups also advocate for the use of public transportation to reduce the number of cars on American roads. Both

those developing and regulating AVs must begin regulation now to ensure AVs are not a harmful technology.

List of Contents

1. Technical Report: Production of Cellulosic Ethanol from Mixed Paper
2. Sociotechnical Research Paper: The Contested Future of Autonomous Vehicles in the US
3. Prospectus