

Why People do not Bike to Work in the Small Community of Buffalo Wyoming:

A Look Into the Safety of Cycling via Road Assessment

Tanner Spade

University of Wyoming Division of Kinesiology and Health;
Honors Program

Mentor: Dr. Christine Porter

University of Wyoming Division of Kinesiology and Health

Introduction

- The obesity epidemic
- Wyoming at nearly 1 in 4 obese adults (CDC, 2012)
- Rates of cycling to work and obesity (Basset et al, 2008)

Summary

- Survey
- Assessment
- Scoring systems

Biking in Buffalo, WY

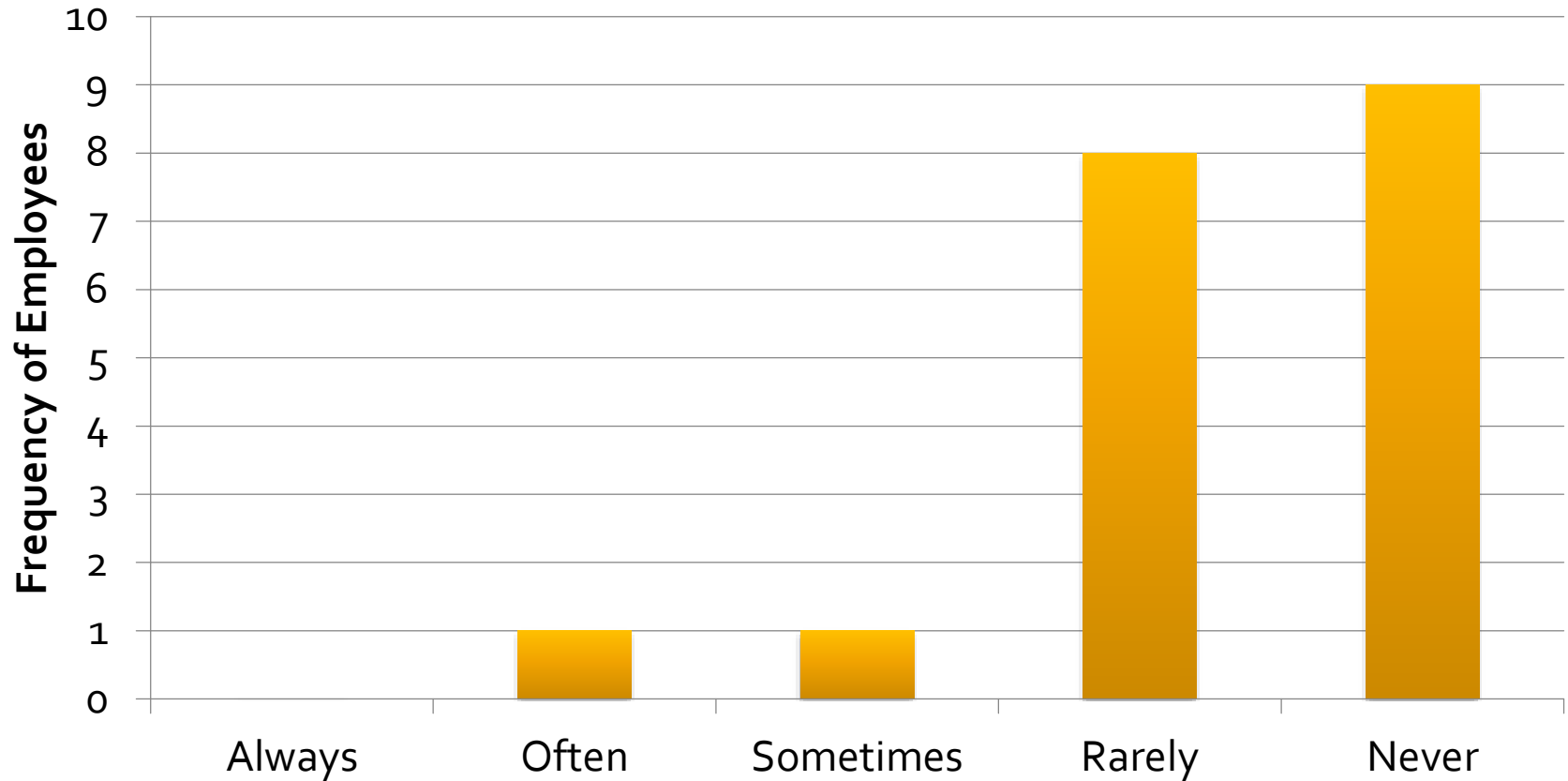
- My experience
- The layout of the town
(Newman & Kenworthy, 1999)
- Biking seems like a good fit?

The Survey

- Survey conducted on 25 businesses on main roads
- 20 responses received (80% response rate)
- Evenly dispersed on 3 main roads assessed

Survey Results

How often Employees Cycle to Work in Buffalo, WY



Bikeability Assessment

- Assess safety of routes to businesses in town

Route Assessment Included

- Imperfections in road (Winters et al, 2010)
- Debris on road (Winters et al, 2010)
- Man made structures (Winters et al, 2010)
- Paved road (Winters et al, 2010)
- Vision obstructions (Constance & Lagarde, 2010)
- Bike lane / shoulder (Winters et al, 2010)
- Traffic speed (Winters et al, 2010); (Pucher, Dijkstra, 2000)
- Dangerous intersections (Korve, Neimier, 2002)
- Bike racks / bike parking (Pucher & Bulcher, 2007)

Multiplication System

- x_1 for inconvenience, x_2 for a wreck, x_3 for traffic related issues

Evaluation	Yes (1 Point)	No (0 Points)	Multiplier	Score
Devoid of any inconvenient imperfections?			X1	
Devoid of any wreck causing imperfections?			X2	
Devoid of man made structures to cause wrecks?			X2	
Is the road paved?			X1	
Devoid of gravel or glass that could cause a wreck?			X2	
Free of vision obstruction that could result in traffic collision?			X3	
Is there a bike lane/shoulder?			X3	
Is the lane marked?			X1	
Is the lane regulation width?			X1	
Is average traffic speed >31.06 mph?			X3	
Are no cars traveling over 40 mph?			X3	
Devoid of dangerous intersections with traffic?			X3	
Access to bike racks/parking?			X1	
Total Score				X/52

What was Assessed

- 3 main roads with businesses – Main Street, Hart Street, Fort Street,
- Split into sections



What was Assessed

- ONLY ROADS!
- City Ordinance chapter 2 article IV states it is unlawful to ride on any sidewalks
(City of Buffalo, 2013)

The Assessment

- Each route was walked, photographs were taken of any object found on the checklist

Imperfections



Man Made Structures



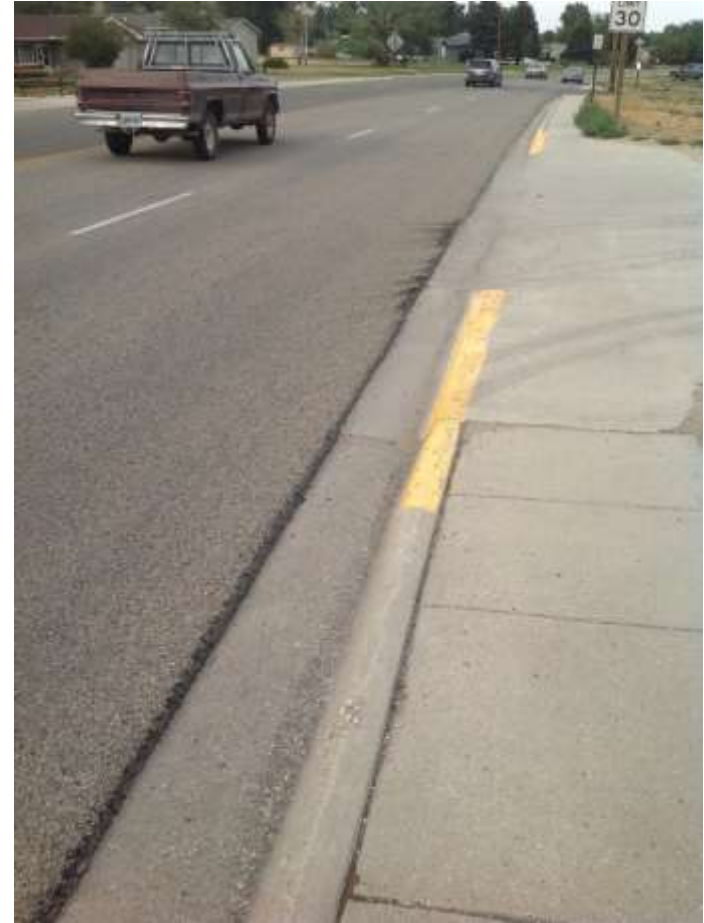
Debris / Glass



Obstructed Vision

- All routes scored on this section
- No pictures to be taken!

Bike Lane / Shoulder



Traffic Speed

- Two factors
- Greater than 31.06 mph
- Over 40 mph

Dangerous Intersections



Access to Parking

- None!

Scored Results

W. Hart Purple	Main Blue	W. Fort Orange	Center Fort Yellow	Down town White	E. Hart Brown	N. Main Green	S. Main Black	Fort Bike Path Red
18	22	28	28	35	35	41	43	48
F	F	F	F	D	C	C	B	A

Average Score: 33.11; D



Score Breakdown

- Outskirts of town: shoulders, safer grates
- Downtown: 20 mph speed limit, no dangerous intersection



Recommendations

- Change dangerous drains for safe ones
- Bike lanes
- Implementation of more bike trails for transportation, not recreation

Conclusion

- Buffalo's results
- The future

Acknowledgements

- Dr. Christine Porter; project mentor
- Sarah Hostetler; aided in data collection

Basset, D. R et al. (2008). Walking, cycling, and obesity rates in europe, north america, and australia. *Journal of physical activity and Health*, 5, 795-814.

Ben-Menachem, T. (2007). Risk factors for cholangiocarcinoma. *European Journal of Gastroenterology & Hepatology*, 19(8), 615-617.

British Bikeability Initiative. Department of Transportation, (2014). *Bikeability site specific risk assessment*. Retrieved from website: http://bikeability.dft.gov.uk/wp-content/uploads/Site_Specific_Risk_Assessment_Guidance.pdf

Bureau of Transportation Statistics. United States Department of Transportation, Research and Innovative Technology Administration. (2002). *Wyoming transportation profile*. Retrieved from website: <http://www.rita.dot.gov/bts/sites>

CDC. Center for Disease Control and Prevention, (2013). *Overweight and obesity*. Retrieved from website: <http://www.cdc.gov/obesity/data/adult.html>

CDC. Department of Health and Human Services, (2007). *Prevalence of regular physical activity among adults --- united states, 2001 and 2005*

Cavacuiti, C. (2009, August 19). Smart cycling. *University of Toronto Forums*. Retrieved from <http://www.research.utoronto.ca/smart-cycling/>

City of Buffalo. Buffalo City Council, (2013). *Motor vehicles and traffic*. Retrieved from website: <http://cityofbuffalowy.com/docview.aspx?docid=31727>

Constant, A., & Lagarde, E. (2010). Protecting vulnerable road users from injury. *PLoS Medicine*, 7(3), 1-4.

Korve, M., & Niemeier, D. (2002). Benefit-cost analysis of added bicycle phase at existing signalized intersection. *Journal of Transport Engineering*, 128(1), 40-48.

Kweon, Y. J., & Kockelman, K. M. (2003). Driver attitudes and choices: Seatbelt use, speed limits, alcohol consumption, and crash histories. *Accident Analysis and Prevention*, Retrieved from http://www.ltrc.lsu.edu/TRB_82/TRB2003-001784.pdf

Massachusetts Bicycle Coalition. Council of Governments, (2012). *Franklin county bikeability assessment*

Massbike. Massachusetts Bicycle Coalition, (2013). *Bikeability assessment*. Retrieved from website: <http://massbike.org/services/bikeability-assessment/>

National Center for Statistics and Analysis. U.S. Department of Transportation, National Highway Safety Traffic Administration. (2009). *Bicyclists and other cyclists: Traffic safety facts*

Newman, P., & Kenworthy, J. (1999). *Sustainability and cities: overcoming automobile dependence*. (pp. xviii-442). Washington, D.C: Island Press.

Ogden, C. L. (2012). Prevalence of obesity in the united states, 2009–2010. *NCHS Data Brief*, 82, 1-8.

Pedestrian and Bicycle Information Center. (01, January 2013). *Bicycle lanes: Purpose & considerations*. Retrieved from http://www.pedbikeinfo.org/planning/facilities_bike

Pucher, J., & Buehler, R. (2008). Making cycling irresistible: Lessons from the netherlands, denmark and germany. *Transport Reviews*, 28(4), 495-528.

Pucher, J., & Dijkstra, L. (2000). Making walking and cycling safer: Lessons from europe. *Transportation Quarterly*, 45(3), 1-33.

Rivara, F. P et al. (1997). Epidemiology of bicycle injuries and risk factors for serious injury. *Injury Prevention*, 3, 110-114.

United States Census Bureau. U.S Department of Commerce, (2010). *Wyoming: 2010*

Winters, M. (2010). Motivators and deterrents of bicycling: comparing influences on decisions to ride. *Transportation*, 38, 153-168.