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Potential Economic Impacts of a Proposed Whitewater Park:

A Market-based Case Study of Stoughton, Wisconsin

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Executive Summary

Whitewater parks are an increasingly credible development option for those communities along rivers seeking to create alternative recreational options and reclaim important natural amenities within their purview. One such effort is taking place in Stoughton, Wisconsin. The proposed Stoughton Whitewater Park will develop a 900 foot stretch of the Yahara River into a whitewater venue that is anticipated to have subtle, yet dramatic, impacts on its downtown while providing an important recreational resource for the residents and visitors within its market boundaries. Once completed, the Stoughton Whitewater Park will be owned and publicly operated by the City.

In this report, we outline the potential market-based economic impacts associated with this proposed whitewater park. First, we assess the market for kayakers within short and long-term drive-times with comparisons to a variety of whitewater parks in other locales across the US. We then apply this market assessment to develop an estimate of whitewater park usage which is then matched with defendable estimates of visitor expenditures at the park and in the surrounding retail and service markets of Stoughton and throughout Dane County. This serves as the basis for economic stimulus thus allowing an estimate of economic impacts. Highlights of our findings include:

1. Conservative estimates suggest that there are at least 30,000 kayakers within a 30-minute drive time to the proposed Stoughton Whitewater Park and 82,000 within 60 minutes. This is of a total population of 400,000 and 1.2 million respectively.

2. Within three hours of Stoughton, there is a total population of nearly 6 million with estimates of this including nearly 434,000 kayakers and over 1 million canoeing enthusiasts.

3. Looking at recent studies that examined 10 other whitewater parks across the US suggests that kayakers spend, on average, over $68 per day on their recreational pursuits. Expenditures could include trip-related spending for food, lodging, automotive, recreational equipment, clothing and supplies among many other items.

4. Certainly, market sizes of whitewater parks vary considerably but average kayaker use from these studies suggest that annual visitation is nearly 15,000 visits per year for annual spending that exceeds $1 million USD.

5. The proposed Stoughton Whitewater Park is analogous to other whitewater parks across the country in drop, release, length and other notable issues associated with whitewater rapids from a recreational asset quality perspective.

6. Development of the Stoughton Whitewater Park is expected to initially draw local kayakers and canoers. With continual site improvements combined with targeted marketing and solid word-of-mouth reviews, use is anticipated to grow in a like fashion to other comparable whitewater parks to attract increasingly large visitor numbers from farther reaches of its market boundaries.

7. Using Stoughton drive-time boundaries to estimate market size can provide specific estimate of potential visitation and visitor spending. If kayakers within 30-minutes visit the Stoughton Whitewater Park once per year, spending will exceed $2 million USD. Extending this market boundary to 60-minutes, this estimate of potential spending increases to over $5.6 million USD annually. And, if extended to 120-minutes (including Milwaukee and the nearby suburbs of Chicago), this estimate of potential spending increases to nearly $30 million USD annually.

8. Depending on additional park components, economic impacts will be generally limited to warm weather months of May through September. Further, these increased receipts are likely to relate to higher visits on weekends. In total, the operation would be available for users 40 to 80 days per year, weather permitting. Revenues generated from the operation would be related to kayak/canoe rentals, lessons, and entrance fees (if any).

9. Non-market economic benefits within this region could involve hedonic premiums placed on real estate values due to the presence of river-based amenities. These increased property values will provide capital appreciation for owners of land in Stoughton. Further, development of the Whitewater Park is likely to generate improved river system function for fisheries and ecosystem function.

10. The Whitewater Park should have a marginal direct benefit on business in Stoughton that are operating on days that the park is open. Local restaurants may see increases in seats occupied, lodging operations could generate room night sales, and retail stores and services may see increased sales, especially those selling sports attire and goods. To generate economic impact, the businesses must be open and participate with other businesses to promote their products and services related to the interests of the whitewater enthusiast.

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1. **Introduction**

Over the past half-century, parks and recreation departments in concert with city planners, locally elected officials, and chambers of commerce across the Upper Midwest have worked diligently to recapture the streams and rivers running through their downtowns. The benefits of this are far-reaching. From adjacent property value enhancements to stimulated demand for local business output resulting in increased local household incomes, rivers are certainly much more than avenues for flood control and transportation. Rejuvenated river towns are witnessing a rebirth in vitality as people reacquaint themselves with more natural open spaces facing the water. Examples across Southern Wisconsin abound and include Sauk City – Prairie du Sac, Baraboo, Jefferson and Fort Atkinson, to name a few. Often, the focal point of these downtowns has become their riverside location with parks and water becoming more in-tune with demands for local restaurants, taverns, accommodations, and specialty shops.[1]

Recreational use of rivers has been a constant over the years. This is particularly so for the mill ponds held up by small dams and the free-flowing water that results downstream. The North American mid-continent has thousands of small and mid-sized dams that were generally installed during the late 19th and early-to-mid 20th Century for flood control and power generation. Water cascading over whitewater rapids has been an important part of the landscape of the Upper Midwest from Sault Ste. Marie, Michigan to Sioux Falls, South Dakota. These flowing waters have also

[1] This is one of a variety of community development strategies recognized as following an "amenity-driven growth" approach which is gaining interest as a fruitful area of research, practice, and literary pursuit (c.f. Cherry and Rickman 2010; Green et al. 2005). A popularized discussion of how water plays a role in successful cities can be found in a recent edition of Outside magazine (August, 2018)

increasingly intrigued recreationists during the recent past [2]. Kayaking, canoeing, and rafting have been shown to be increasing as outdoor recreation activities in recent recreation demand studies. Indeed, roughly 25 percent of Wisconsin residents 16 years and older partake in these three activities (Wisconsin, State of 2011). This accounts for just over 1,000,000 Wisconsin residents. Additionally, the same study estimated that roughly 428,000 Chicagoans come to Wisconsin to canoe, kayak, and raft every year. Certainly, the demand for this type of outdoor recreation is increasingly large.

Parks that cater to whitewater enthusiasts present a unique and interesting community resource. Historic examples abound with one of the likely most well-known and natural venues of the sport since the 1950's being Interstate State Park and the Dalles of the St. Croix River as it flows past Taylors Falls, Minnesota and St. Croix Falls, Wisconsin (City of Taylors Falls 2011). Other examples of developed whitewater parks across the Upper Midwest include the Wisconsin River as it passes through Wausau, WI (WKCC 2015); the Cedar River and Charles City, Iowa (Miller et al. 2011); the Huron River and several Michigan communities including Ann Arbor (Isely et al. 2017); the Grand River as it runs through Grand Rapids, Michigan (Watkins and Bowers 2014) and the Crow River as it passes through Watertown, Minnesota (Schnieder et al 2015) to name just a few.

The case which provides the geographic focus of this report is represented by a proposal to develop a portion of the Yahara River by the city of Stoughton, Wisconsin. The Stoughton Whitewater Park is planned to encompass a 900 foot stretch of the river as it passes just south of downtown in what is now Riverside Drive Park and its adjacent downstream Mandt Park. The most recent version of the site plan for this venue is shown in Figure 1.

[2] While early travelers of the North American continent saw whitewater rapids as an impediment to navigation and developed the "portage" to circumnavigate, more recent perspectives of whitewater rapids as recreational assets have gained popularity. The interested reader is referred to discussion here and here with more discussion of organized rapids guides in Bennett (1996) or McGinnis (2005) .

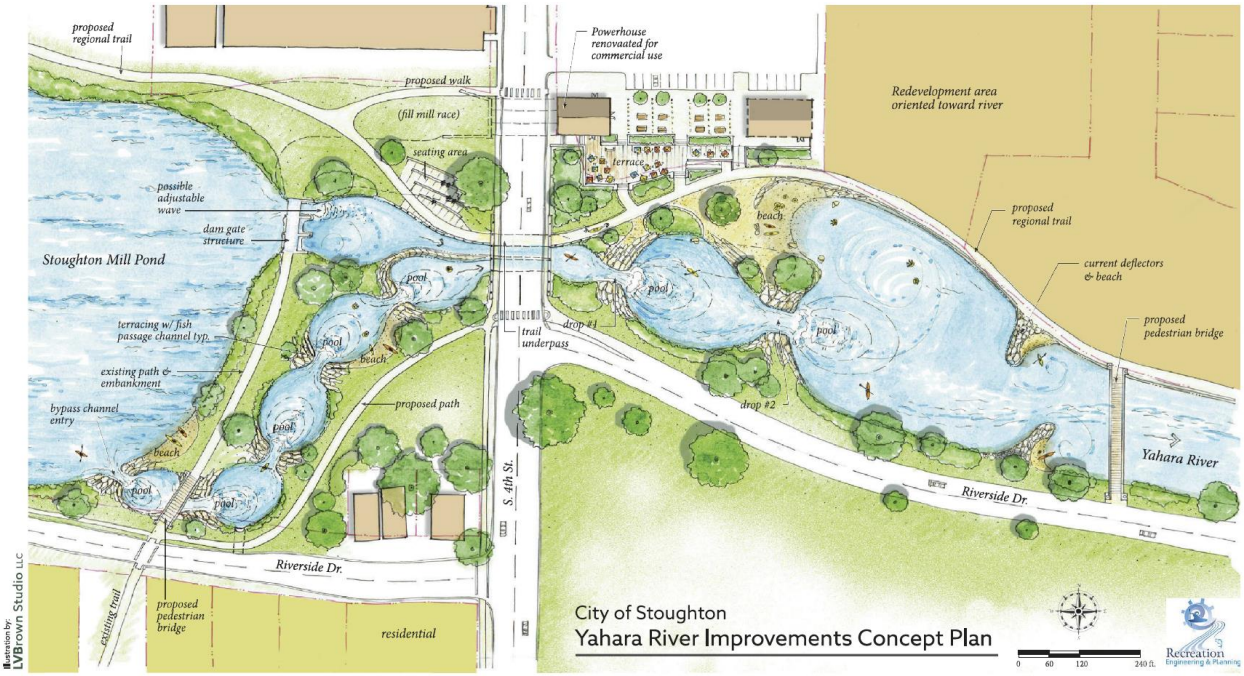

Figure 1. Conceptual plan for the Stoughton Whitewater Park (Recreation Engineering)

Whitewater parks are constructed around areas with elevation change. Depending on the water flow and what class rapid is wanted, eight to twenty-four inches of drop in elevation is required to create a rapid. Dams are a logical location for placement of whitewater parks since they are also built in locations with elevation changes. The Stoughton dam has nine feet of elevation change from the Stoughton Millpond downstream to the Yahara River. This elevation change is sufficient to create a whitewater park. This location also works with the State of Wisconsin riparian laws since the City of Stoughton owns land on both sides of the river from the dam downstream over 1,300 feet.

Recreation Engineering & Planning (REP) from Boulder, CO was selected to develop a conceptual plan for the area in February of 2018. They presented City of Stoughton staff with three options for a whitewater park in Stoughton including (1) dam removal, (2) dam in place with in-stream features downstream of the Stoughton dam, and (3) bypass channel. After discussing the options internally and having initial discussions with stakeholder groups, the bypass channel option was selected. In this

option, the current dam would be maintained but experience lower water flowage due to the existence of a bypass channel in which water would be diverted through a series of rapids. This bypass is what constitutes the whitewater park venue. The reasoning behind this was to minimize impact to the water levels upstream of the Stoughton dam while still creating a destination for paddlers.

This park rehabilitation project is still on the drawing board and is anticipated to cost over 2 million dollars to be completed within the next few years. After completion, the facility will incur operating revenues and expenses, that may or may not break even. Revenues might include equipment rental, concessions, special events and related registrations, camps, and other incomes. Likely expenses will include maintenance and repairs, administrative expenses including insurance, marketing, energy, and payroll.

Once completed, the effects of such a whitewater park will bring benefits to Stoughton and its surrounding region. This topic provides the impetus for the work contained in this report. Here, our problem is to develop estimates of potential market-based economic impacts of a whitewater park in Stoughton. We will outline the experiences of other similar whitewater parks developed during the recent past across the United States. Our attention will focus on the documented economic impacts associated with these whitewater parks. In doing so, we will glean specific characteristics and data to develop a general estimate of expected visitation and potential spending resulting from this visitation. This will serve as a basis upon which we can arrive at a defensible range of anticipated economic impacts specific to the Stoughton Whitewater Park. Other comparable Whitewater parks need to be analyzed carefully to ensure an apples-to-apples comparison. In particular, it will be important to acknowledge differences in length of season as influenced by climate. Also, comparable facilities need to offer similar challenge, thrill, and duration of experience

Market-based benefits provides the scope of our quantification work. While non-market benefits are important and will be discussed, this will be done only conceptually with the impact assessment limited to use values and market-based benefits.

2. Approach **Used to Estimate Potential Economic Impacts**

It is important to note the obvious fact that data detailing characteristic use of this whitewater park do not exist because the park does not exist. Thus, any results found herein should be understood to be nothing more than an educated estimate based on the best available alternative and applicable data. A case study approach will be employed to utilize available data with a plan to return with a longer-term study plan to assess change over time. Specifically, we will develop estimates using a meta-analysis of results from a variety of published documents combined with comparative demographic data pertinent to the Stoughton, WI region. We also apply data on participation rates for kayaking from the demand study portion of a recent Wisconsin Statewide Comprehensive Outdoor Recreation Plan, or SCORP (Wisconsin, State of 2012).[3] This then leads to an estimated range of expected usage. We then will employ expenditure patterns from related research combined with expenditure pattern data from similar parks elsewhere to develop an annualized estimate of visitor spending. This will then become an estimate of the impact on the local and regional economy which will serve as a basis for an overall estimate of regional economic change (Crompton 2010).

In pursuing the available and pertinent literature, we did uncover a variety of peer-reviewed manuscripts that addressed whitewater parks as an increasingly important component of local recreation (c.f. Benson 2015; Kainzinger et al. 2017; Loomis and McTernan 2015; Stephens et al. 2015; Yoachim 2005; Jones et al. 2000; Wu and Liang 2011). While these contributions did focus on a variety of related topics dealing with property rights, legal issues, conceptual development, and an interesting array of non-market benefit assessments, they were not directly relevant to our need to estimate market impacts based on whitewater park user characteristics.

[3] Statewide Comprehensive Outdoor Recreation Plans (SCORPs) have been done in each US state and are normally updated every five years. In Wisconsin at the time of this writing, the "new" Wisconsin SCORP (2018-2023) was not yet published so we have reverted to use of the most recent published in 2012 (2011-2016).

This said, we also found an array of study reports for specific whitewater park assessments that appear as appropriate for comparative purposes. The available literature useful to this assessment can be safely characterized as "gray". Namely, it is found in consultancy reports and planning analyses that, while educated, were not formally peer-reviewed. These reports were typically done by university extension specialists and/or private consultants. These study reports are summarized in Table 1.

Table 1. Reports that addressed and estimated economic impacts of various whitewater parks in the United States

Location	Reference*
Grand Rapids, MI	Watkins and Bowers (2014)
Ann Arbor, MI	Isley et al. (2017)
Watertown, MN	Schneider and students (2015)
Charles City, IA	Miller et al. (2011)
Skowhegan, ME	O'Hara et al. (2016)
Siloam Springs, AR	Deck and Jebaraj (2016)
Durango, CO	RPI Consulting (2006)
Fort Collins, CO	Loomis and McTernen (2011)
Golden, CO	Hagenstad et al. (2000)
Steamboat Springs, CO	Raucher et al. (2005)
Cascade, ID	Braak (2012)
Willamette Valley, OR	ECONorthwest (2015)
Reno/Truckee, NV	TRRP (1999)

* complete reference can be found in the Literature Cited section later in this report.

Important attributes of context are needed for these studies to be useful for application to the Stoughton, Wisconsin situation. Certainly, market size and proximity to demand centers is important. Also, the design of the whitewater park and its comparison to usage of other similar parks requires assessment of usage types. While other parks may offer additional amenities catering to other recreational uses (such as tubing and mountain biking), our assessment of visitation is constrained to the context of kayaking and canoeing usage.

Also, upon opening, growth in visitor numbers will require both site quality maintenance and appropriate marketing. While the former will certainly happen with diligent recreation management practices, the latter requires advertising, networking, and solid word-of-mouth from influential sources. One of the few useful trajectories in growth is documented in the example from Ann Arbor, Michigan --- Gallup Park and Argo Park on the Huron River (City of Ann Arbor 2017; Isely et al. 2017). Developed during the 2000s and open since 2010, this canoe and whitewater park provides a close parallel situation to the Yahara River and Stoughton Whitewater Park. From livery records, the growth in people using canoes and kayaks on the Huron River in Michigan is tracked in Appendix A (Figure A1) as is a summary of livery expenses and revenues (Figure A2). This can assist in our projections of how usage should progress once the Stoughton Whitewater Park opens; projected to occur in 2021.

Our assessment is built on both visitor numbers and individual expenditure patterns in the Park and in the community. Use of expenditure patterns by visitor type from other studies are likewise subject to context and serve as a basis for market-based stimulus to local businesses. While categories of visitor spending vary widely in the studies found in Table 1, we will standardize using proportions found in a recent study of canoers looked at to examine Wisconsin state park impacts (Prey et al. 2013).

3. **Stoughton and the Market for Whitewater Parks**

Stoughton, Wisconsin is an exurban municipality of about 13,000 people in close proximity (within 20 miles) to Madison, WI. Certainly, the Madison region of roughly 400,000 urban residents and a metropolitan area of almost 650,000 serves as a logical market area. Combine this with the regional uniqueness of a whitewater park nearby both Milwaukee (roughly 75 miles distant with a metro population of 1.6 million) and Chicago (roughly 120 miles distant with a metro population of 9.5 million) and the effective market area grows dramatically. Our demographic work compares and contrasts the Stoughton market region with other regions that have comparable whitewater parks.

For context, the location of Stoughton, Wisconsin relative to various markets can be assessed using drive-time analysis. This is made possible using ESRI products. The geographic information system provides drive-times in terms of average traffic and highway conditions and when centered on Stoughton, Wisconsin, is summarized in Figure 2.

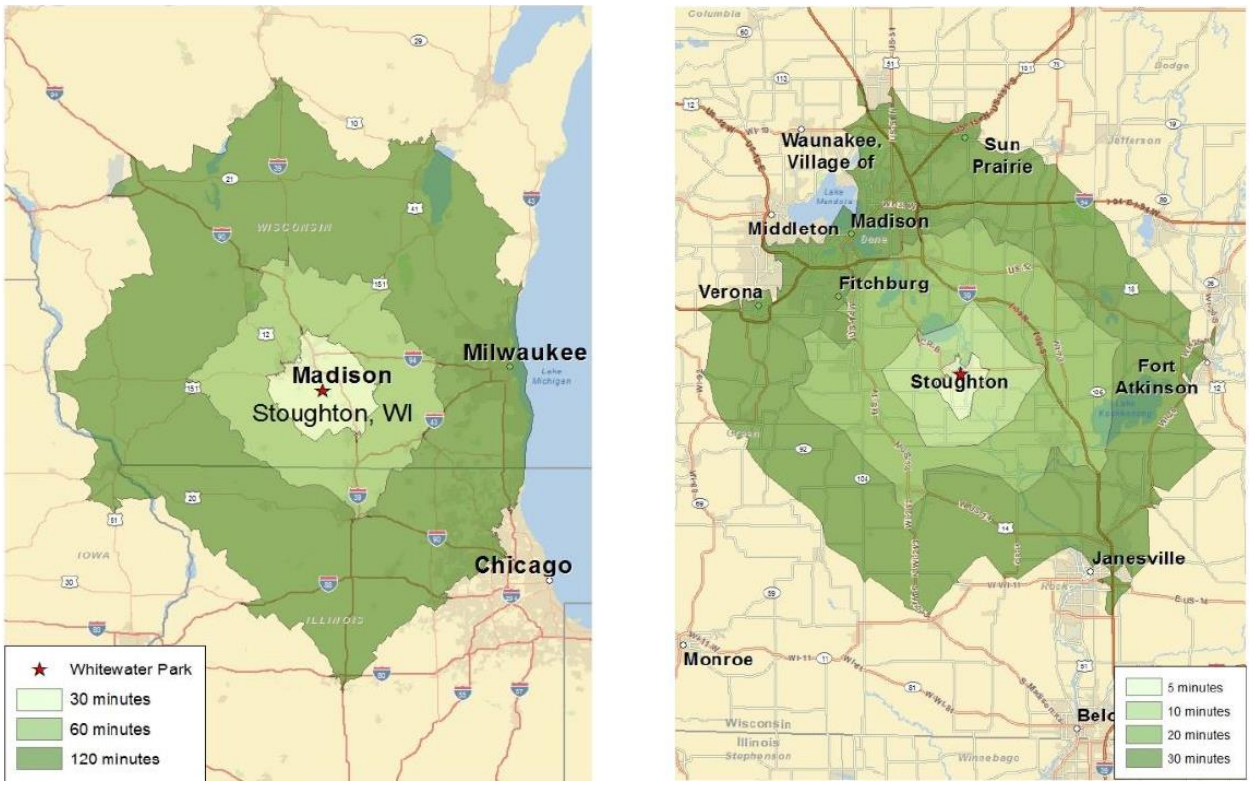

Figure 2. Long-term (left) and short-term (right) drive times to the proposed Stoughton Whitewater Park from surrounding geographies (ESRI).

Drive-times from proximate geographies are shown in Figure 2 for long-term travel (left side) and short-term travel (right side). Note that the short-term 30-minute distance ring covers most of the Madison region up to Sun Prairie and Waunakee, Wisconsin and extends southward to the northern parts of Janesville, Wisconsin. The population within this 30-minute ring is 403,808 according to 2010 US Census (converted by the ESRI Business Analyst Desktop).

The long-term 2-hour distance ring (left side of Figure 2) suggests the potential for a broader Stoughton Whitewater Park market. While the 30-minute distance ring covers the Madison metropolitan region, a 2-hour drive-time to Stoughton extends to Milwaukee, Tomah, and Wausau, Wisconsin, Dubuque, Iowa, and the Illinois cities of Rockford down to the northeastern suburbs of Chicago. This broader market includes a population within the long-term ring of nearly six million (5,943,007) according to the 2010 US Census (converted by ESRI Business Analyst Desktop).[4]

For comparison, the whitewater park cities found in Table 1 have various regional markets. While we did not conduct drive time analyses for these geographies, a gross assessment of populations and proximate urban regions are summarized in Table 2. Note from this Table that roughly close market analogues can be found in several of the case examples where whitewater parks have been analyzed. In particular, Ann Arbor, Michigan and the Colorado case of Golden appear to be particularly useful.

Limiting our assessment of alternative whitewater park case studies on those locations where whitewater parks are completed. Characteristics of completed and operating whitewater parks are summarized in Table 3. It is interesting to note that the proposed Stoughton Whitewater Park at a length of 900 feet and a vertical drop of 9 feet, while at the low end of the range, compare favorably with other whitewater parks. Also note from Table 3 that the Ann Arbor, Michigan case example provides an interesting comparative whitewater park and canoeing river to the Yahara and proposed Stoughton Whitewater Park.

[4] This provides a brief snapshot of the ESRI Business Analyst Desktop results and, for brevity, we highlight only population estimates. Other relevant information includes rough estimates of entertainment and recreation spending of the population; a portion of which could be used for kayaking on the Stoughton Whitewater Park. For instance, estimates suggest that within the short-term 30-minute travel ring, average household entertainment/recreation spending was just over $5,000 with an annual total of over $500 million. Within the 60-minute ring, the average household entertainment/recreation spending was lower with a total of roughly $1.5 billion. And finally, within the 120-minute ring, the average entertainment/recreation spending was almost $3,500 with a total of over $8 billion annually.

Table 2. Whitewater parks found in Table 1 with population and nearby-city data

City	Population	Region Population	Nearby Cities
Cascade, ID	723	9,897	Boise (1.5 hr~)
Watertown, MN	4,298	95,562	Minneapolis (~1 hr), St. Paul (1.5 hr)
Charles City, IA	7,496	16,004	Rochester (1.5 hr), Cedar Rapids (~2 hr), Des Moines (~2.5 hr)
Skowhegan, ME	8,397	51,363	Portland (1.5 hr), Boston (3 hr~)
Steamboat Springs, CO	12,336	23,239	Denver (~3 hr), Boulder (3 hr~),
Durango, CO	17,817	51,917	
Siloam Springs, AR	16,095	525,032	Tulsa (1.5 hr), Springfield (2.5 hr), OKC (3 hr), Little Rock (3 hr~)
Golden, CO	20,268	2,599,504	Denver (0.5 hr), Boulder (0.5 hr), Fort Collins or CO Springs(~1.5 hr)
Oregon City, OR	61,299	2,226,009	Portland (0.5 hr), Vancouver (0.5 hr), Salem (~1 hr), Eugene (1.5 hr)
Ann Arbor, MI	118,087	344,791	Detroit (0.5 hr), Lansing (1 hr), Toledo (1 hr), Cleveland (~3 hr)
Fort Collins, CO	157,251	305,525	Boulder (1 hr~), Denver (1 hr~), Colorado Springs (2 hr~)
Grand Rapids, MI	193,887	988,938	Lansing (1 hr), Ann Arbor (2 hr), Detroit (2.5 hr), Chicago (~3 hr)
Reno, NV	237,121	425,417	Sacramento (2 hr~)

Table 3. Characteristics of completed and operating whitewater park projects

City	Water Flow*	Operator	Vertical Drop	Rental/Concession	Length/# Drops**	Level
Ann Arbor, MI	100-300	City	na	Yes/Yes	1050/9	I-II
Cascade, ID	400-3,500	Private	na	Yes/Yes	1250/na	III
Charles City, IA	200-5,000	City	na	No/No	1200/3	II
Durango, CO	500-6,000	City	na	No/No	1430/na	II-III
Golden, CO	250-1,000	City	na	No/No	800/na	IV
Siloam Springs, AR	na	City	.5	No/No	700/2	II
Steamboat Springs, CO	200-6,000	City	7.7	Yes/No	16,000/na	III
Wausau, WI	650	City	35	Yes/No	1850/6	II-III
Reno, NV	700-3000	City	na	Yes/No	1400/5 + 1200/6	II-III

* Water flow is measured in cubic feet per second
** Length and # drops reflect venue length (in feet) and number of drops (number of pools) of each venue.
"na" indicates data not available.
Source: American Whitewater and/or reports listed in Table 1.

Turning our attention to the Stoughton market drive-time assessment, we have an interesting set of market sizes depending on drive time and type of use. Due to the lack of primary data, we simply apply participation estimates from the recent SCORP (Wisconsin, State of 2012). Participation estimates for kayaking, canoeing, and rafting are applied to the various populations of the Stoughton Whitewater Park market and are summarized in Table 4. Note from this Table that when extended to the three-hour

drive time boundary, estimates suggest the relevant extent of the whitewater market for kayaking, rafting, and canoeing to encompass some 2 million people.[5] The question then becomes how successful the Stoughton Whitewater Park will be in penetrating this market given competition both regionally and nationally from other larger and more challenging destinations. What might its competitive niche be? These questions should be addressed in future work to develop a comprehensive marketing plan for the proposed Stoughton Whitewater Park.

Table 4. Participation rates specific to Wisconsin residents participating in various recreational activities reflective of populations within various drive-times of the proposed Stoughton Whitewater Park.

Participation rate of Wisconsin residents by relevant user groups: *		2010 population within drive-times**		
		0-30 min	0-60 min	0-120 min
		403,808	1,120,974	5,943,007
Canoeing	17.90%	72,282	200,654	1,063,798
Rafting	9.20%	37,150	103,130	546,757
Kayaking	7.30%	29,478	81,831	433,840

* Source: 2011-2016 Wisconsin Statewide Comprehensive Outdoor Recreation Plan, Chapter 2 (Wisconsin, State of 2012).

** Drive time rings from Figure 2 regional delineations and US Census data converted by ESRI Business Analyst Desktop. Total populations by region found in row just below drive-times.

[5] The application of these statewide participation rates to the Stoughton drive-time boundaries could provide pause. In response to this criticism, we would point out that the use of Wisconsin statewide estimates of recreation participation to the Stoughton drive-time markets is likely conservative given the youthful exuberance of the Madison region. We would argue that water-based recreation rates across the board (and kayaking in-particular) would likely be higher. Of course, further research would be needed to confirm this hunch.

4. **The Potential Economic Impacts of Trip-Related Expenditures**

Usable expenditure patterns and annual visitation were outlined in the various reports listed in Table 1. While estimation methods varied widely, if we simply took a macro approach and averaged all visitation numbers and expenditure patterns for specific users, we could generate an "average" of the averages reported in each report. Such a summary is found in Table 5. The obvious problem with this approach is that it completely glosses over the variety of analytical methods, sample sizes, and definitions associated with user groups. For our purposes, this can be best-viewed as a gross starting point for our estimate. It also provides context for the subsequent calculations of visitor expenditures. Given that the Stoughton Whitewater Park will cater primarily to kayakers, we will apply the average daily expenditure for kayakers in subsequent calculations.

Table 5. Expenditures and Visitation Levels of Whitewater Park Visitors*

Population	Daily Expenditure	Annual Visits	Total Annual Expenditure
Average kayakers	$68.40	14,911	$1,019,935
Average tubers	$24.60	22,760	$559,896
Average of all users	$65.97	44,376	$2,927,601

* From the reports listed in Table 1, we averaged only those user types that were relevant to the Stoughton application. Kayakers and tubers were listed as uses in a limited number of studies and the sample averages reported were then averaged. All users average includes more types of use thus this is not the simple sum of the two.

Note from this Table that average daily expenditures and annual visitation figures specific to kayakers lead to an average total expenditure of just over 1 million USD. This provides context to subsequent estimates that are specific to the Stoughton market for kayakers that represent values for the Stoughton Whitewater Park. This contrasts with an average combined value of 37,671 kayakers and tubers using the liveries on the Huron River near Ann Arbor. Were we to use this value as a base for application of the growth trend from the Ann Arbor work, we could generate the

projected trend in visitation that could be expected to occur at the proposed Stoughton Whitewater Park.

Table 6. Potential annualized spending of kayakers visiting the Stoughton Whitewater Park venue by category of spending and in-total.

Spending Category:	Baseline:[1]		Kayaker Spending[2]	Annual Visitor Expenditures:[3]		
	Daily Spending	Percentage		30-minute	60-minute	120-minute
Accommodations	$7.47	8.73%	$5.97	$175,955	$488,451	$2,589,599
Restaurants and Bars	$14.38	16.80%	$11.49	$338,719	$940,284	$4,985,065
Gasoline and Auto	$26.98	31.52%	$21.56	$635,510	$1,764,177	$9,353,063
Groceries and Liquor	$13.33	15.57%	$10.65	$313,986	$871,626	$4,621,065
Entertainment	$2.74	3.20%	$2.19	$64,540	$179,164	$949,866
Miscellaneous Retail	$2.53	2.96%	$2.02	$59,594	$165,432	$877,066
Admissions/fees/licenses	$4.02	4.70%	$3.21	$94,690	$262,861	$1,393,599
Equipment rent & repair	$4.63	5.41%	$3.70	$109,059	$302,748	$1,605,066
Equipment Purchase	$9.52	11.12%	$7.61	$224,242	$622,497	$3,300,265
Total	$85.60	100.00%	$68.40	$2,016,295	$5,597,240	$29,674,656
Kayaking market				29,478	81,831	433,840

1. Baseline applies expenditure pattern for canoers from previous Wisconsin Park System impact study (Prey et al. 2013) to derive percentages by spending category which are then applied to average total spending for kayakers from Table 5.
2. Kayaker spending uses simple percentages by spending category to total average spending from Table 5 and represents an average daily expenditure for kayakers in nominal dollars.
3. Expenditures are annualized assuming that kayakers within each drive-time market (last row of Table 6) make one visit per year to the Stoughton Whitewater Park.

To estimate economic impacts of these potential expenditures, input-output analysis can distinguish among direct impacts, indirect impacts, and induced impacts. Given the very gross estimates of the potential for upfront visitor expenditures resulting from a completed Stoughton Whitewater Park, we will leave this input-output analysis for further research.[6] That said, previous input-output analysis into recreational use impacts for the Wisconsin State Park System (Prey et al. 2013) was conducted and used MicroIMPLAN 3.0 for a 10-county region known as the Southern Gateways Region (including Stoughton and Dane County). This work (ibid Table 5 on page 9) suggested that input-output multipliers for this region ranged from between 1.36 for employment

[6] Development of an input-output model specific to this region and its use with various levels of visitor spending would be an added cost that is not included in the scope of research conducted for this report. It is readily available and can be conducted by the research team authoring this report but remains for future work if desired.

to 1.76 for total value added (1.63 for labor income and 1.70 for output). In addition to estimating inter-industry transactions taking place, the IMPLAN model can account for margining by sector. Margining is important in translating visitor expenditure into economic impact, particularly for retail sectors. These statements notwithstanding, an estimate of total regional economic impacts using input-output models would be generally larger when compared to the level of visitor expenditures and will be based on estimates of income accruing to businesses and households within the region.

Visitor expenditures provide the basis for market-based economic impacts resulting from recreational use of local parks and recreation services (Crompton 2010). Non-market economic returns associated with local recreational asset development could also involve local benefits in important but less tangible community characteristics. These non-market benefits represent improved quality-of-life, resident satisfaction, ecosystem function, and impacts on local real estate. The latter issue associated with proximity of recreational asset developments to local real estate value is an increasingly important area of resource economics research. Using an approach known as hedonic pricing, premiums placed on real estate values due to the presence of river-based amenities can be isolated but remain beyond the scope of research conducted here. These increased property values will provide capital appreciation for owners of land in Stoughton. Further, development of the Whitewater Park is likely to generate improved river system function for fisheries and ecosystem function.

5. Summary, Conclusions, and Policy Implications

In the applied research reported here, we assess the potential for increased local economic stimulus resulting from public investment in the proposed Stoughton Whitewater Park. In this assessment, we use drive-time market analysis combined with recreation participation rates and estimates of visitor spending from other studies to develop potential spending resulting from development and use of the proposed Stoughton Whitewater Park.

Results suggest that that there are at least 30,000 kayakers within a 30-minute drive time to the proposed Stoughton Whitewater Park and 82,000 within 60 minutes. This is of a total population of 400,000 and 1.2 million respectively. Within three hours of Stoughton, there is a total population of nearly 6 million with estimates of this including nearly 434,000 kayakers and over 1 million canoeing enthusiasts.

The proposed Stoughton Whitewater Park is analogous to other whitewater parks across the country in drop, release, length and other notable issues associated with whitewater rapids from a recreational asset quality perspective. Looking at recent studies that examined 10 other whitewater parks across the US suggests that kayakers spend, on average, over $68 per day on their recreational pursuits. Expenditures could include trip-related spending for food, lodging, automotive, recreational equipment, clothing and supplies among many other items.

Certainly, market sizes of whitewater parks vary considerably but average kayaker use from these studies suggest that annual visitation is nearly 15,000 visits per year for annual spending that exceeds $1 million USD. Development of the Stoughton Whitewater Park is expected to initially draw local kayakers and canoers. With continual site improvements combined with targeted marketing and solid word-of-mount reviews, use is anticipated to grow in a like fashion to other comparable whitewater parks to attract increasingly large visitor numbers from farther reaches of its market boundaries.

Using Stoughton drive-time boundaries to estimate market size can provide specific estimate of potential visitation and visitor spending. If kayakers within 30-minutes visit the Stoughton Whitewater Park once per year, potential spending will exceed $2 million USD. Extending this market boundary to 60-minutes, this estimate of potential spending increases to over $5.6 million USD annually. And, if extended to 120-minutes (including Milwaukee and the nearby suburbs of Chicago), this estimate of potential spending increases to nearly $30 million USD annually.

Depending on additional park components, economic impacts will be generally limited to warm weather months of May through September. Further, these increased

receipts are likely to relate to higher visits on weekends. In total, the operation would be available for users 40 to 80 days per year, weather permitting. Revenues generated from the operation would be related to kayak/canoe rentals, lessons, special events, concessions, camps, and other operations.

Non-market economic benefits within this region could involve hedonic premiums placed on real estate values due to the presence of river-based amenities. These increased property values will provide capital appreciation for owners of land in Stoughton. Further, development of the Whitewater Park is likely to generate improved river system function for fisheries and ecosystem function.

The Whitewater Park should have a marginal direct benefit on business in Stoughton that are operating on days that the park is open. Local restaurants may see increases in seats occupied, lodging operations could generate room night sales, and retail stores and services may see increased sales, especially those selling sports attire and goods. To generate economic impact, the businesses must be open and participate with other businesses to promote their products and services related to the interests of the whitewater enthusiast.

Historically, the use of parks and related recreational services have not been thought of as contributing to the local economy through tourism. Large projects like the proposed Stoughton Whitewater Park need to be thought of as economic development projects for a community. This exercise is put forward to provide a picture to stakeholders and elected local officials of the market-based benefits of such a project to Stoughton's economy. The elected officials then can make a choice to invest scarce public funds in such a project. Furthermore, results could also provide information to citizens if such a proposal goes to referendum. Finally, this effort helps provide the Wisconsin Department of Natural Resources with information about how the project would impact and support local businesses related to outdoor recreational use. As part of a grant application to help cost-share investment in this project, our work stands ready for developing additional and more detailed estimates to be used during the grant review and project implementation process.

Literature Cited

Bennett J., 1996. *The Complete Whitewater Rafter*. Camden, ME: Ragged Mountain Press.

Benson RD. 2015. Protecting River Flows for Fun and Profit: Colorado's Unique Water Rights for Whitewater Parks. *Ecology Law Quarterly* 42: 753-786.

Braak, W. 2012. 2011 *Economic Impact of Kelly's Whitewater Park in Cascade, Idaho: An Overview of the Park's Second Year in Operation*. University of Idaho Extension.

Cherry, T and D Rickman (eds). 2010. *Environmental Amenities and Regional Economic Development*. New York, NY: Routledge.

City of Ann Arbor 2017. *City of Ann Arbor Canoe Liveries*. Powerpoint presented by the Ann Arbor, MI.

City of Taylors Falls 2011. *Taylors Falls Comprehensive Plan: A Plan of Conservation and Development*. City Council: Taylors Falls, MN. Accessed via internet at: https://www.ci.taylors-falls.mn.us/vertical/sites/%7BC4DF7AF2-3980-4104-AEC5-C0A9A2B6536D%7D/uploads/Taylors_Falls_Comprehensive_Plan(1).pdf

Crompton, JL. 2010. *Measuring the Economic Impact of Park and Recreation Services*. Research Series 2010. Ashburn, VA: National Recreation and Park Association.

Deck, K and M Jebaraj. 2016. *Estimating Potential Visitorship and Expenditures from the Proposed Whitewater Park near Siloam Springs*. Fayetteville, AR: University of Arkansas Center for Business and Economic Research..

ECONorthwest. 2015. *Willamette Falls Whitewater Park: A Prospective Economic Analysis*.

Green, GP, SC Deller, and DW Marcouiller (eds.). 2005. *Amenities and Rural Development: Theory, Methods, and Public Policy*. New York, NY: Edward Elgar Publishing.

Hagenstad, M, J Henderson, RS Raucher, and J Whitcomb. 2000. *Preliminary Evaluation of the Beneficial Value of Waters Diverted in the Clear Creek Whitewater Park in the City of Golden*.

Isley, P, C Glupker, EE Nordman, JM Cowie, H LaMay. 2017. *The Economic Impact of the Huron River*. Seidman Research Office; Grand Valley State Univesity.

Jones, C., Hollenhorst, S. J. and Perna, F., 2000. Validation of the Flow Theory in an On-site White-Water Kayaking Setting. *Journal of Leisure Research*, 32(2) 247-261.

Kainzinger, S, A Arnberger and RC Burns. 2017. Whitewater recreationists' preferences for social, resource and managerial attributes in the Alpine Nature and Geopark Styrian Eisenwurzen. *Eco.mont Journal of Protected Mountain Areas Research* 9(2): doi:10.1553/eco.mont-9-2s52

Loomis, J and J McTernan. 2011. *Fort Collins Whitewater Park Economic Assessment*. Fort Collins, CO: Colorado State University, Dept. of Agricultural and Resource Economics..

Loomis, J and J McTernan. 2015. Economic value of instream flow for non-commercial whitewater boating using recreation demand and contingent valuation methods. *Environmental Management* 53: 510–519

McGinnis W. 2005. *The Guides Guide Augmented*. WhitewaterVoyages.com.

Miller, T, M Palermo, A Rude, T Kleinschmidt, A Kass, and J Tjaden. 2011. *Charles City Strategic Plan for Sustainable Riverfront Development: Paddling into the Future*. Iowa Research Online.

O'Hara, F, K Young, and K Cannon. 2016. *Economic Impact of the Proposed Run of River Whitewater Park in Skowhegan, Maine*. Planning Decisions, Inc.

Outside. 2018. 8 habits of highly successful cities. Outside. August 2018. Accessed via: https://www.outsideonline.com/2334246/habits-highly-successful-cities

Prey, J, DW Marcouiller, and D Kim. 2013. *Economic Impacts of the Wisconsin State Park System: Connections to Gateway Communities.* PR-487-2013. Madison, WI: Wisc. Dept. of Natural Resources.

Raucher, RS, J Whitcomb, J Henderson, and J Rice. 2005. *The Potential Beneficial Values of Waters Diverted in the Yampa River for the Steamboat Springs Boating Park*. Stratus Consulting, Inc., Boulder, CO.

RPI Consulting. 2006. *City of Durango, Colorado: Economic Impacts of Whitewater Recreation*.

Schneider, I and students. 2015. *Summary and Integrated Impact Assessment for Watertown Whitewater Recreation Opportunity*. Resilient Communities Project, University of Minnesota.

Stephens, TA, BP Bledsoe, BD Fox, E Kolden, MC Kondratieff. 2015. Effects of whitewater parks on fish passage: a spatially explicit hydraulic analysis. *Ecological Engineering* 83: 305-318.

TRRP 1999. *Truckee River Recreation Plan. Economic Impact of Recreation Use Expenditures*. 43-49

Watkins, SD and SN Bowers. 2014. *Economic Benefits of the Grand Rapids Whitewater Project*. Anderson Economic Group, LLC

Wisconsin, State of. 2012. *Wisconsin Statewide Comprehensive Outdoor Recreation Plan 2011-2016*. Chapter 2. PR-027-2012. Madison, WI: Wisconsin Department of Natural Resources.

WKCC 2017. *Master Plan for Wausau Whitewater Park*. Wausau Kayak/Canoe Corporation: Wausau, WI.

Wu, C and R Liang (2011). The relationship between white-water rafting experience formation and customer reaction: a flow theory perspective. *Tourism Management*, 32 (2011), 317-325.

Yochim, MJ. 2005. Kayaking playground or nature preserve? Whitewater boating conflicts in Yellowstone National Park. *Montana: The Magazine of Western History* 55(1): 52-64.

Appendix A. Trend in Livery Use on the Huron River, Michigan near Ann Arbor.

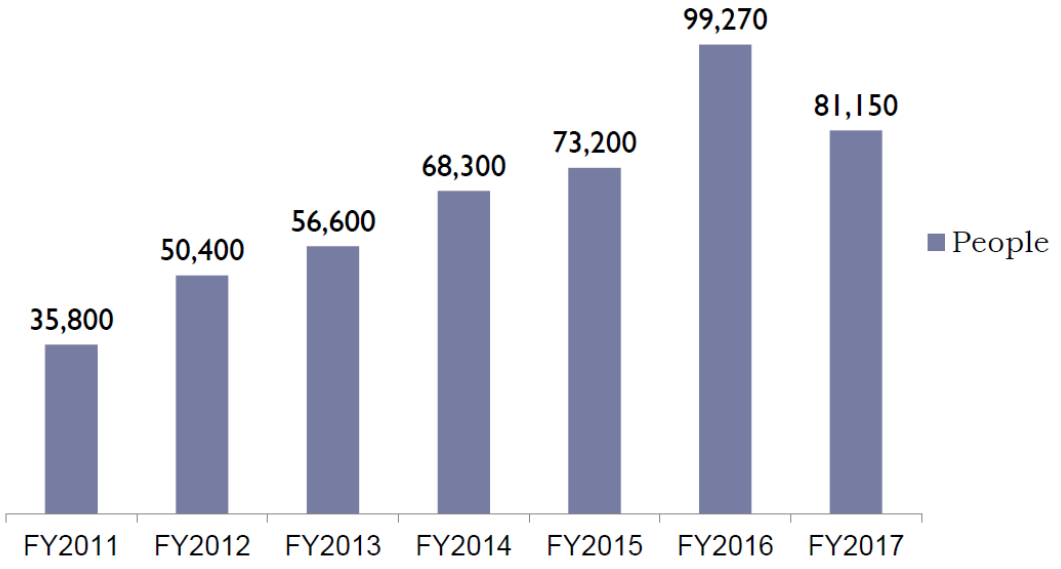

Figure A1. Number of people in livery boats; Huron River liveries of Gallup Park and Argo Park (taken from City of Ann Arbor, 2017).

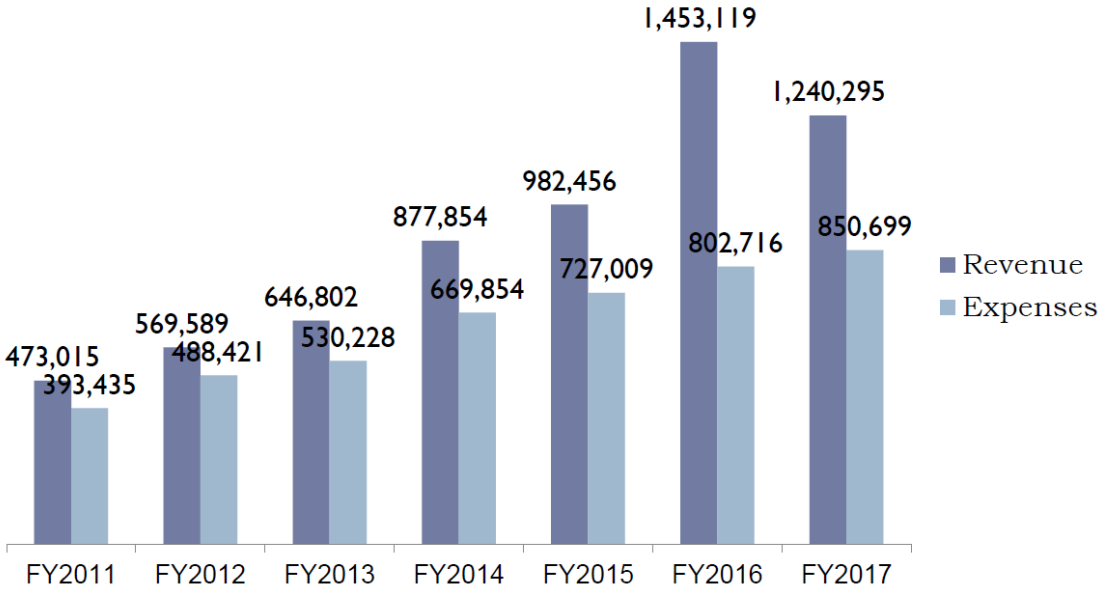

Figure A2. General fund revenue and expenses (from City of Ann Arbor 2017)