

**Community and Regional Planning 490H
Honors Project**

**A Comparative Case Study:
Modern Streetcars and Issues
in Ames Public Transit**

Supported by the Iowa State University Foundation

Tony Borich

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Executive Summary

Modern streetcar and historic trolley systems have recently been implemented in a number of communities across the country, from large metropolitan areas to small cities. Like Ames, these communities featured fixed-rail public transit for many years prior to the introduction and widespread use of the automobile. Today, with renewed appreciation for and interest in communities built around transit choices other than the car, Ames has an opportunity to capitalize on its fixed-rail heritage, improve the University's appeal, enhance the economic vitality of the city, and bridge a growing divide between students and the permanent residents of the community.

This study demonstrates that implementing a Federal Transit Administration-funded fixed-rail system in Ames would be feasible. Local capital expenditures are estimated to be between \$7,465,400 and \$8,835,000. With available sources of revenue, no property tax increase would be necessary. Operating expenditures would result in an increase in city, university or student subsidy of public transit estimated to be between \$44,340 and \$583,000, or an increase of less than 20% above current levels of support.

Introduction

This study preliminarily examines the feasibility and effects of implementing fixed-rail transit in Ames, based on the models provided by Portland, Oregon's and Tampa, Florida's downtown streetcar systems, as well as Kenosha, Wisconsin's, and Memphis, Tennessee's historic trolleys. The study is divided into three parts. The first part, "Why Study Modern Streetcars?" discusses similarities and differences between Ames, Kenosha, Portland, Memphis and Tampa pertinent to this study of fixed-rail transit. The second part, "What Issues Exist?" is a broad analysis of various issues relating to the construction of fixed-rail transit in Ames, such as route and vehicle selection, capital costs, and operating expenditures. The third part is a series of sections examining the potential effects of implementing fixed-rail transit, from economic development impacts to the potential positive effects fixed-rail could have on redeveloping social capital in Ames.

Part I: Why Study Modern Streetcars?

On the surface, an analysis comparing any aspect of Portland, Tampa or Memphis with anything related to Ames, Iowa seems ill considered. However, for reasons discussed later, it does not make sense to limit the scope of this study to smaller cities such as Kenosha, Wisconsin. Demographically, Ames is very dissimilar to the other three large cities. Portland, Tampa and Memphis are major metropolitan areas, with populations of 529,121, 303,447 and 650,100 respectively, while Ames only recently reached metropolitan status, with a population of 50,731 (U.S. Census, 2000). Portland and Tampa's Central Business Districts are measured in square miles; Ames' Main Street Cultural District is measured in square blocks. Moreover, and more importantly, the physical infrastructure, land use and associated patterns of mobility are very dissimilar. Tampa's skyline features numerous commercial skyscrapers; Ames' skyline features a municipal electric plant. Approximately 12,902 people live in downtown Portland while the number of people living in downtown Ames probably measures in the hundreds (Brookings Institution, 2001). In Portland, hundreds of retail businesses and large companies attract thousands of workers daily. Again, employment in the Main Street Cultural District is probably not greater than one to two thousand.

The key to comprehending the value of studying these cities' modern streetcar systems is to recognize the range of factors influencing public transit use. For example, in 2003, the Portland Streetcar served almost 1,500,000 passengers (Dannen, 2004) while Tampa's streetcar, known as "TECO," served just over 500,000 (FTA, 2003). Cy-Ride's Red Route served 747,062 passengers from August of 2003 to August of 2004, while the Orange Route served over 1,625,000 passengers (Bourne, 2004). Overall, Cy-Ride

served nearly 4,750,000 riders on fixed-route service, an impressive statistic given that national public transit usage averages less than 5 percent (APTA, 2003). Thus, fixed-route public transit usage is not accurately predicted by factors such as metropolitan area population; instead, fixed-route usage is a function of factors like availability of parking and access to automobiles, distance from transit stops to destination and origin points, frequency, cost of transit and transit mode. In short, the critical factor in determining the worth of public transit investment is not the size of the metropolitan area.

The fundamental basis of Cy-Ride's popularity is the same reason that fixed-rail transit is a realistic possibility in Ames, and why the modern streetcar model should be considered. Iowa State's Central Campus, the primary center of activity in Ames, is predominantly pedestrian. For students, in particular, parking is extremely limited, and other modes of transportation for students living off-campus are, in fact, more reliable than using an automobile and attempting to find a parking space. Walking, certainly, is the mode choice of many. However, public transit, provided either through direct bus service to campus, or using Cy-Ride's Orange Route park and ride service, is the only viable option for many who live outside of walking distance to campus. Every day classes are in session, tens of thousands of students, staff and faculty on campus are forced to leave behind their automobiles and do something that virtually never occurs in many communities much smaller and much larger than Ames: people use their own two feet or hop on the bus to get where they need to go.

The geography of each community also provides a rationale for choosing each system as a model for fixed-rail transit in Ames. The Portland Streetcar line extends approximately 2.4 miles one-way, forming a loop of 4.8 miles of track. The distance

between the Main Street Cultural District and Central Campus, in comparison, is approximately 2 miles one-way. In addition, Portland's Streetcar connects Portland State University, a major institution serving 12,145 full time students, with the city's Central Business District, just as fixed-rail transit in Ames would (Portland State University, 2003). Tampa's line, meanwhile, also extends approximately 2.4 miles one-way, with double track along portions of the route. A portion of Memphis' 2.5 mile double track downtown streetcar runs on a pedestrian mall, demonstrating that streetcars are appropriate vehicles to operate in predominantly pedestrian environments, such as Iowa State's Central Campus (APTA, 2004).

Finally, modern streetcar systems use a mix of vehicle types and capacities that seem to suit Ames' circumstances. The first type used in Portland, shown below, has an aerodynamic, futuristic appearance, has a capacity of approximately 150 passengers and is capable of speeds of up to 30 miles per hour.



Figure 1: Passengers boarding Portland's Streetcar



Figure 2: The interior of Portland's Streetcar

The second type, a historic trolley replica, has a capacity of approximately 50 passengers and is an accurate reproduction of the trolleys that were fixtures of many American cities early last century (Dannen, 2004).



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Figure 3: Passengers boarding Tampa's historic trolley

The vehicles run concurrently on the same track, with both vehicle types sharing the track on Saturdays and Sundays. Tampa and Memphis, meanwhile, rely exclusively on historic trolleys on a scale that may be appropriate to serve as a link between Main Street and campus.

Thus, although superficially a case study comparison between Ames and a city as large as Portland may seem absurd, this study is significantly limited to comparative analysis of transportation corridors. Moreover, the example provided by Kenosha suggests that modern streetcar systems need not be limited to major metropolitan areas. Ridership data, in particular, conclusively demonstrates that the modern model might provide useful insight into the potential for enhancing public transportation here in Ames.

Part II: What Issues Exist?

When considering any public investment project, the multitude of issues involved can be daunting. Public investments occur in the context of limited resources; benefits are balanced with costs and effects not always easily quantified. Governments generally respond to the interests of their constituents, and often must convince the public that a project is worth investing in. This section presents an analysis of a number of the most obvious issues that must be resolved when considering an investment in fixed-rail public transit in Ames.

History of Fixed-Rail Transit in Ames

Although the current resurgence in public transit in Ames, made possible by Cy-Ride, is impressive within the context of the pervasive use of the automobile in our society today, it used to be fixed-rail public transit that dominated Ames' transportation mode decision-making. Ames' beginnings as a railroad town are evident still today with

the Union Pacific railway carrying frequent freight trains through the city. The railroad depot, located on Main Street, is further evidence of the significance of the railroad to Ames' development. Passenger travel on rails, which began in 1885, reached high levels before it ceased running through Ames in 1960. "By 1900, there were a dozen passenger trains making [daily] scheduled stops in Ames. By 1915, that number had reached approximately twenty-four ... trains arriving and departing from the Ames station" (Farwell, 1993).

Originally, passengers arriving in Ames at the depot en route to the Iowa State campus had to take a connecting horse-drawn carriage that led across Squaw Creek on an unpaved path. The Nichols and Maxwell Livery [Stables], located across the depot on Main Street, provided "service for passengers, their baggage and U.S. mail to the [college]. The growth in enrollment and prominence of the college had created the need for a faster and more reliable means of transportation, especially between the Chicago & Northwestern Depot and the college campus" (Farwell, 1993). A year and half after the idea was conceived, a steam rail line was opened that extended from the east end of Main Street, past the Chicago & Northwestern depot and across Squaw Creek to the Iowa Agricultural College campus. The *Ames Evening Times* credited the recently constructed rail line with "adding materially to the growth of [downtown]." "Operating on an hourly schedule, its popularity with townspeople, college faculty and students was apparently immediate." Up to three passenger cars were used and filled to capacity during the busy hours of the day.

The Fort Dodge & Southern Company purchased the line in 1907. The company subsequently replaced the standard gauge track steam engine with an electric trolley line

that ran down Main Street and then looped around the Iowa State College Central Campus. This streetcar line continued to operate, charging up to seven cents a fare, until 1929, when the company petitioned to cease summer operations and thereafter never resumed service. The original steam rail line, known as the “Dinkey,” features prominently in Iowa State’s history. Materials used to construct Beardshear, Curtiss and Marston Halls, three edifices of Iowa State’s Central Campus, were brought to the college during the Dinkey’s operational period (Farwell, 1993).

Route & Vehicle selection

Given the essential historical role of fixed-rail transit in Ames, and particularly in its early history, consideration of any future service logically begins by interpreting the past in today’s context. In 1929, when streetcar operation ceased, Iowa State College had 4,171 students. Today, 27,380 students attend Iowa State University and the University counts over 10,000,000 gross square feet of building space (Iowa State University, 2003). Thousands of students now live in University-owned housing on-campus, and thousands more live directly adjacent to campus. Today, Ames is home to thousands more residents. Thus, the community and university have changed dramatically. However, the right-of-way of the previous steam rail line, as well as the streetcar line, is almost all still undeveloped and publicly owned. Because acquisition of private land is neither politically popular nor financially feasible, the original right-of-way forms a series of corridors that may provide inexpensive land on which to construct new fixed-rail transit. Moreover, new fixed-rail service would probably be more positively viewed if a historical synergy can be achieved with the earlier fixed-rail service. A major trend in urban planning today, known as “New Urbanism,” attempts to recreate aspects of the cities of the past – walkable communities and mixed-use developments, for example. A

major component of U.S. cities in the past was the use of the streetcar. Numerous neighborhoods in Des Moines, for example, were known as streetcar suburbs, connected by electric rail service to the downtown core. In Ames, the historical right-of-way, not coincidentally, is adjacent to many of the city's historical sites, from the Farm House and other Iowa State University structures to buildings on Main Street, such as the Sheldon-Munn hotel. Thus, for financial, practical and historical reasons, the original right-of-way is a logical starting point for future fixed-rail corridor analysis.

However, nostalgia is only worth so much. It is important to note that the original privately run streetcar-based service essentially became obsolete in 1929. If the service that existed then were implemented today, it would probably similarly unsuccessful. While Ames and Iowa State University have grown dramatically, potential ridership between Central Campus and Main Street has almost certainly declined. During peak periods only approximately one hundred passengers board Cy-Ride's Green and Red Routes in the Main Street Cultural District vicinity. This apparent contradiction illustrates the significance of activity centers and trip generation analysis.

Cy-Ride's transit ridership data provides a useful guide indicating where the greatest current bus ridership and potential fixed-rail ridership exists in Ames today. Cy-Ride's fixed-routes provide service to much of Ames, with 4 primary and heavily traveled routes known as the Orange, Red, Green and Blue routes. The Orange Route is a free circulator route that connects the commuter parking lots/Cy-Ride Park and Ride facility with Central Campus. The Red Route connects North Grand Mall, the Main Street Cultural District, south and southwest Central Campus, and the South Dakota Avenue corridor. The Green Route connects North Grand Mall, the west end of the Main

Street Cultural District, Central Campus and the Ontario Street corridor. Finally, the Blue Route connects the East Ames Hy-Vee neighborhood, Campustown, Central Campus, University Village and North Grand Mall. As shown in Figure 4, the Orange Route serves the most passengers of any Cy-Ride route, at rates that greatly exceed the average weekday rider statistics for the Portland Streetcar, a comparative model for this study.

Source: Ames Transit Agency, Portland Streetcar, Inc.

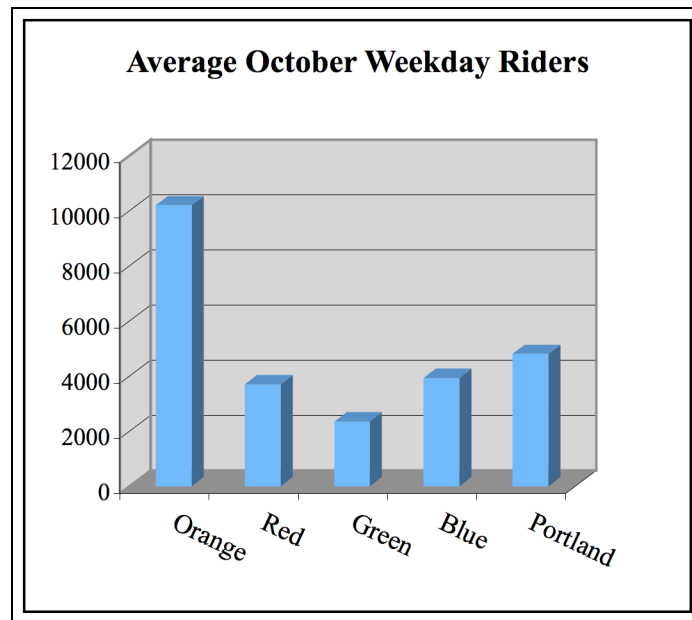


Figure 4: Cy-Ride and Portland Streetcar daily ridership

Source: Ames Transit Agency, Portland Streetcar, Inc.

Route	Total Weekday Riders	Average Weekday Riders	Total Riders – All Days	Average Riders – All Days
Orange	235023	10218	-	-
Red	85179	3703	92423	2981
Green	54123	2353	55954	1805
Blue	90511	3935	99038	3195
Portland Streetcar	-	4817	-	4347

Table 1: Cy-Ride and Portland Streetcar daily ridership

Despite Cy-Ride's popularity, a number of deficiencies exist within Cy-Ride's current transit system. The Red and Green routes, for example, currently provide service from the Main Street Cultural District to Central Campus, just as the original Dinkey and subsequent streetcars used to provide. Approximately 100 persons per hour ride these routes from the Main Street Cultural District to campus during peak periods, which takes approximately 15 minutes one-way (Bourne, 2004). However, these routes do not effectively serve passengers on the east half of the Main Street Cultural District or on the northeast half of Central Campus. For example, a rider traveling downtown and boarding at Kildee Hall on the northeast side of campus would use the Green Route, but this route does not serve the east half of Main Street. Similarly, a rider boarding at the Ames Public Library would use the Red Route, but could not use the Red Route to travel to Bessey Hall, because that route does not serve the north end of campus. Trips such as those described above could take 30 minutes or more, because of the walking necessary as a result of this lack of coverage. Although the total distance from ISU to downtown is just 2 miles, many users on campus may be discouraged from traveling downtown due to the time constraints involved.

Other significant deficiencies that exist with Cy-Ride's current transit system relate to the service's Orange Route. The Orange Route's southern bus stop facility, the Cy-Ride Park and Ride facility, is located adjacent to Hilton Coliseum, Stephens Auditorium and Jack Trice Stadium. These entertainment venues are used throughout the year and attract hundreds of thousands of facility users, often causing demand for parking in excess of available spaces. However, transit service from the Iowa State Center during the times these entertainment and cultural facilities are being used is only sporadic,

meaning the events held at these facilities are only accessible to those with automobiles or those who live within walking distance.

Finally, due to the Orange Route's excessive popularity, up to 11 buses are concurrently used during peak periods to serve passenger volume. Particularly during the afternoon periods, when most passengers are traveling from Central Campus to the commuter lots, this causes inefficiencies to develop. Although buses are intended to be spaced at regular intervals, certain buses spend more time than others loading and/or unloading passengers. As this occurs, these buses slow, which increases the numbers of passengers arriving to board at each stop, further delaying the buses. These additional passenger loads result in the buses filling to near capacity, causing additional slowing as passengers shift at each stop to allow more passengers to board. Often, other buses will catch up to the buses ahead of them. On the Orange Route, it is not uncommon to see a single capacity bus running immediately ahead of one or two other buses that are not full, because the first bus in the series is serving the bulk of the passengers. The end result of this pattern is lengthened travel time for riders and uncomfortable, packed buses running while others on the route are less than half full.

Collectively, these deficiencies could be addressed by implementing fixed-rail service that would replace and re-align the Orange Route, in addition to linking downtown with Central Campus while combining the Red and Green Routes into one. Such a service, which I will call "Cy-Ride Express," would follow the route indicated in Figure 5 on the following page.

Figure 5: Cy-Ride Express routes and stops

(attached)

Because Cy-Ride Express would directly connect the Main Street Cultural District, east and west Central Campus, the Iowa State Center and the Cy-Ride Park and Ride facility, current weaknesses in Cy-Ride's service could be remedied. With vehicle capacities much larger than Cy-Ride's existing buses, riders traveling from the commuter lots to Central Campus will enjoy more regular, predictable service in more comfortable vehicles. As an added benefit, west Central Campus, where the Orange Route does not currently reach, would be served by fixed-rail service. Large events at the Iowa State Center, such as concerts, football or basketball games, could be integrated with the larger community and enhanced by fixed-rail service. Finally, the current unacceptable transit choices for users riding from downtown to Central Campus, and vice versa, would be resolved. Assuming an average operating speed of 10.5 miles per hour, the streetcar could carry a passenger from Great Plains Sauce and Dough to the Food Sciences Building on campus in approximately 10 minutes. A similar trip using existing Cy-Ride routes, which would involve walking nearly a mile in total to and from the closest bus stops, would take at least 25 minutes.

Cy-Ride Express service linking Main Street with campus, while not exactly replicating the route followed by the original Dinkey and subsequent streetcar service, would be a close approximation of it. Certain physical and infrastructure features that exist today and did not exist in the past, or have changed since fixed-rail service was discontinued in Ames, make it impossible or imprudent to consider exactly following the original right-of-way. The Union Pacific Railroad, for example, will not allow local rail service to operate and cross its mainline tracks at grade. In addition, the Dinkey's original bridge over Squaw Creek is likely not suitable for continued use today. Finally,

Grand Avenue now passes under the Union Pacific Railroad and Main Street, adding another obstacle. In short, while it is logical to follow the original route of the Dinkey and/or streetcar along Main Street and from Elwood Drive to the west end of campus, it is probably more economical to follow Main Street across the Grand Avenue underpass and then follow 6th Street across the northern spur railroad, Squaw Creek, and under the Union Pacific mainline. The bulk of the service would still follow the original route, a historical link that could be useful in marketing the service as a community attraction.

Vehicle selection could also add to this historical element. Portland's streetcar system operates two vehicles. The first, a lower capacity vintage trolley vehicle known as the Council Crest trolley, has a capacity of approximately 40 passengers. The Gomaco Trolley Company, based in Ida Grove, Iowa,

manufactures the Council Crest and other vintage trolley vehicles that have been brought into use in many cities across the country. The vintage trolley runs on the weekends in Portland and has proven to be very popular.

The second, a high-capacity, futuristic looking vehicle built by a European manufacturer, is shown to the right. The vehicle features low boarding and multiple entrance and exit doors, allowing efficient high volume passenger

boarding. In addition, the vehicle is ADA-compliant. On the weekends, this vehicle shares the track with the vintage trolley vehicles. TECO, Tampa's streetcar, also uses



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Figure 6: Portland trolley



Figure 7: Portland streetcar

Gomaco vintage trolleys. Tampa's historical attributes are featured on the trolley service's website. The restored historic trolleys used in Kenosha, Wisconsin, are approximately fifty years old (APTA, 2004).

Capital Expenditures

Construction and capital costs of fixed-rail, or of any public investment project, are often a subject of contentious debate. Numerous projects compete for limited resources, and politicians are generally loath to ask for tax increases to pay for public projects. It is likely that construction of fixed-rail in Ames would represent the largest transportation-related investment in Ames' history. However, consideration of the capital costs cannot occur without discussing available funding sources. For public transportation improvements, the sources of funds are considerable.

A. Capital Expenditures Funding Sources

The Federal Transit Administration oversees a program called "New Starts," which covers the 80% of the total capital costs of transit improvements. New Starts is the "federal government's primary financial resource for supporting locally-planned, implemented, and operated transit 'guideway' capital investments" (FTA, 2004). While the vast majority of New Starts-approved projects are located in major cities, a new program, known as "Small Starts" is being created to fund small projects. New Starts funds projects with capital costs exceeding \$75 million, while Small Starts funds will be available for projects costing from \$25 to \$75 million. A recent version of the federal transportation bill, known as TEA-21, reserves nearly \$1 billion for Small Starts projects (California Institute for Federal Policy Research, 2003). Similarly to the New Starts program, Small Starts projects are 80% federally funded, with only 20% of the capital costs needing to come from local or state sources.

There are a number of state programs through which the local match capital costs of fixed-rail improvements in Ames may be funded. Two possible funding programs are listed in the Iowa Department of Transportation Funding Guide: “Intermodal Pilot Project Program,” and “Iowa Clean Air Attainment Program (ICAAP)” (IA DOT, 2003). In addition, due to the historical and tourist-oriented aspects of the Main Street to campus link, the project is a prime candidate for Vision Iowa or Community Attraction and Tourism (CAT) funding (IA IDED, 2004). Taking into account all of the available funding sources, local capital costs to the City of Ames and Iowa State University would likely be less than 20% of the total cost for fixed-rail improvements.

The Portland Streetcar was constructed in 2000 at a cost of \$57,000,000. Although federal funds were not used to fund capital costs, the equivalent 20% local match for a project that size would be \$11,400,000. Tampa’s TECO line, meanwhile, was constructed at a cost of \$32,000,000. The 20% local match for a similarly sized project in Ames would be just \$6,400,000. As table 2 shows, similarly priced projects have been completed or are under construction in Ames.

Project	City of Ames Contribution
Ames Middle School	\$28 million (Story County sales tax)
Ames High School	\$9 million (Story County sales tax)
Ada Hayden Heritage Park	\$5 million (Property taxes)

Table 2: Recent Ames capital improvement projects

Although I believe a local contribution of \$11,000,000 is still a realistic amount for a city the size of Ames, the good news is that fixed-rail improvements in Ames based on the Portland model almost certainly cost substantially less here. It is likely that total capital construction costs would be closer to the Tampa model.

B. Capital Costs Estimate – Track Mile Comparison & Discussion

Table 3 compares the length, cost and other relevant features of the Portland Streetcar, Tampa TECO line and Memphis’ trolley and uses that data to predict a cost per track mile for a similar system in Ames.

Source: APTA & Portland Streetcar, Inc.

	Portland Streetcar	TECO	Memphis	“Cy-Ride Express”	
Length of corridor	4.8 miles	2.4 miles	2.5 miles	~3.1 miles	
Length of track	4.8 miles	~ 4.0 miles	5.0 miles	~5.6 miles	
	Portland’s system is a one-way 4.8-mile loop following a series of one-way streets through Portland’s Central Business District. The TECO line features single track and double track. Memphis’ system is a double track route extending 2.5 miles, including through a downtown pedestrian mall. Cy-Ride Express would be primarily composed of double track, with single track only along some portions of the eastern section of the route.				
Cost/track mile	\$11,875,000	\$8,000,000	\$8,400,000	~\$7,300,000	
	Portland’s capital expenditures total includes about \$6,000,000 in costs that are unique to Portland, such as the track crossing with Portland’s light rail system. The adjusted cost/track mile, excluding the items unique to Portland, is \$10,600,000. In addition, the capital expenditure plans for the three other systems include expenditures that will not be necessary or as costly in Ames. For example, 4% of construction costs for Portland are earmarked for traffic control, an issue likely to cause greater headaches and costs in Portland’s Central Business District than in Ames. In addition, a significant portion of the proposed Cy-Ride Express route will be located along grassy areas without pavement that must be removed, further reducing construction costs. Finally, cost per track mile is reduced when a greater proportion of track is constructed side-by-side, as in Memphis’ model. The Memphis system features “elaborate” stations built into the pedestrian mall, added costs that would not be necessary in Ames. In addition, the Memphis system was designed to light rail specifications, so that Memphis can provide future service to destinations far away from its downtown core. For these reasons, an Ames estimate of \$7,300,000/track mile seems reasonable; intuitively, it seems likely that it would cost less to construct a similarly sized streetcar system in Ames than in downtown Tampa, FL, or Memphis, TN.				
Capital Expenditures	\$57,000,000	\$32,000,000	\$42,000,000	~\$40,880,000	
Equivalent Match	Local	\$11,400,000	\$6,400,000	\$8,400,000	~\$8,176,000

Table 3: Capital costs estimate based on track mileage

C. Capital Costs Estimate – Itemized Estimate

Rockingham, Australia, conducted a 2001 study of downtown transit alternatives, including streetcars, light rail and optically guided buses. The study estimated general capital expenditures for each system, broken down by component. In table 4, average costs that greatly exceed the estimates provided by the Rockingham study are used to estimate Cy-Ride Express capital expenditures.

Source: Sinclair Knight Merz

Component	Rockingham Estimate Cost (US\$)	Cy-Ride Express Estimate Cost	Cy-Ride Express Estimate
Track	\$575-\$750 per track meter	\$750 per track meter	\$6,720,000 (\$750 * 8960 meters)
Stations/stops	\$25,000 per stop	\$35,000 per stop	\$455,000 (\$35,000 * 13 stops)
Overhead contact system (OCS), signals & communication	\$1 mil per route mile	\$2.5 mil per route mile	\$7,750,000 (\$2.5 million * 3.1 miles)
Operating and maintenance facility	\$5,000,000	\$5,500,000	\$5,500,000
Vehicles		\$1,750,000 per modern streetcar \$1,000,000 per vintage streetcar	\$18,750,000 (\$1.75 million * 9 modern vehicles + \$1 million * 3 vintage streetcars)

\$39,175,000 + \$5,000,000 contingencies
\$8,835,000 local contribution (using high estimate costs)

\$32,327,000 + \$5,000,000 contingencies
\$7,465,400 local contribution (using Rockingham estimate costs)

Table 4: Capital costs estimate based on Rockingham itemized costs study

D. Capital Costs Estimate – Kenosha, Wisconsin Discussion

Kenosha, Wisconsin, a city of approximately 93,000, revived its streetcar system in 2000, after a hiatus of nearly 70 years. The community built a 1.9-mile vintage trolley

system for just \$4,000,000, or a cost per track mile of just \$2,105,000 (APTA, 2004).

While the Kenosha system does not have nearly the operating capacity that a system in Ames would need, some interesting observations can be drawn from the Kenosha model nonetheless. First, the Kenosha system was not constructed in a major central business district, so it avoided incurring costs such as traffic control or repositioning of layers of utilities. Second, some stretches of the Kenosha line were constructed in grassy areas, just as a system in Ames would be. The Kenosha line uses a unique track-in-grass design, developed by Stone Consulting & Design of Pennsylvania, which hides the concrete support base under a layer of turf (Stone Consulting & Design, 2003). This design style would seem to suit Iowa State's Central Campus well, and would reduce the visual impact of Cy-Ride Express to nil. Although the Kenosha system saved substantial costs just by purchasing inexpensive heritage trolley vehicles, it conclusively demonstrates that streetcar capital costs vary widely based on the circumstances of each community. The system that Kenosha constructed could be enhanced with larger capacity vehicles in the future, providing service equivalent to the much more expensive systems in Portland, Memphis or Tampa, at a fraction of the cost. The environment that Cy-Ride Express would be constructed in is more similar to Kenosha, Wisconsin than Portland, Tampa or Memphis. The Kenosha model, when combined with the estimates provided by the Rockingham study, suggests that the initial estimate of total capital costs for Cy-Ride Express of \$40,000,000, with an \$8,000,000 local contribution, is conservative.

E. Capital Costs – Can Ames Afford to Build Cy-Ride Express?

A \$6 million-\$8 million local contribution could be raised through a variety of sources. A primary source of funding could be tax increment financing (TIF). A TIF district could be set up in the Main Street Cultural District vicinity, in anticipation of development that will be attracted there as a result of the streetcar. Such a district would actually cover a large portion of the capital costs and other Main Street Cultural District improvements, without requiring any additional property tax revenue. A TIF district would raise revenue for Cy-Ride Express in a multi-step process. First, the MSCD and vicinity would be designated a tax increment financing district. “The taxable value of that district is then frozen to the value it was on the day of the declaration. The frozen value is usually called the base. All jurisdictions [such as school districts and the City of Ames] that had taxing authority over the newly-formed TIF district still have taxing authority over the base.” As the district develops, “the incremental value of taxes that would have been collected by all of the taxing authorities is retained by the city to pay off the costs” of Cy-Ride Express and other appropriate improvements that would promote economic development within the district. “This new value is generally called the increment. Over time, when all of the public investment costs are paid off, the incremental taxable value [is] released back to all of the taxing jurisdictions who are then able to capture the new taxable value increment for their general funds” (Swenson, 2002). Thus, the TIF would be used to generate economic development downtown that would not otherwise occur, eventually raising property tax revenue for all levels of government.

Cy-Ride Express TIF Scenario

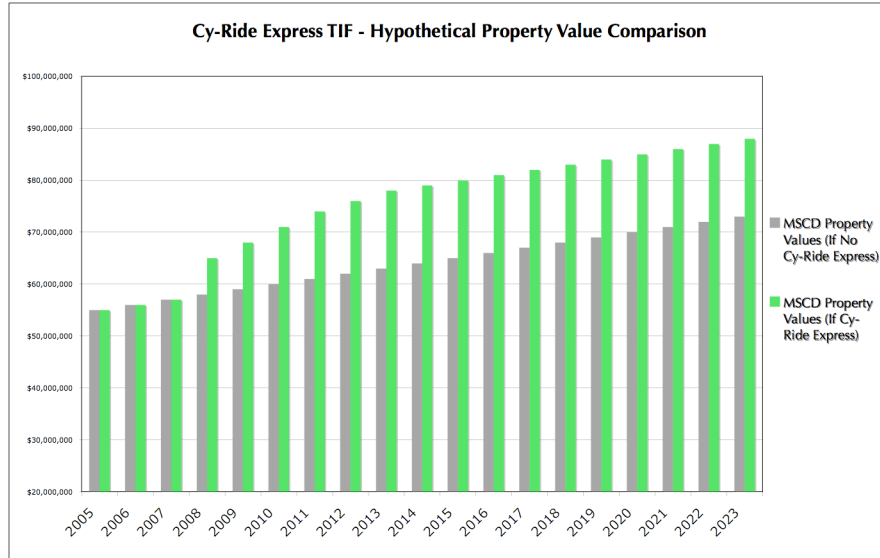


Figure 8: Theoretical MSCD property valuation increase

If Cy-Ride Express and a TIF district (the TIF would pay some portion of Cy-Ride Express' capital expenditures) are implemented in 2007, the theoretical graph above shows how MSCD property values could increase.

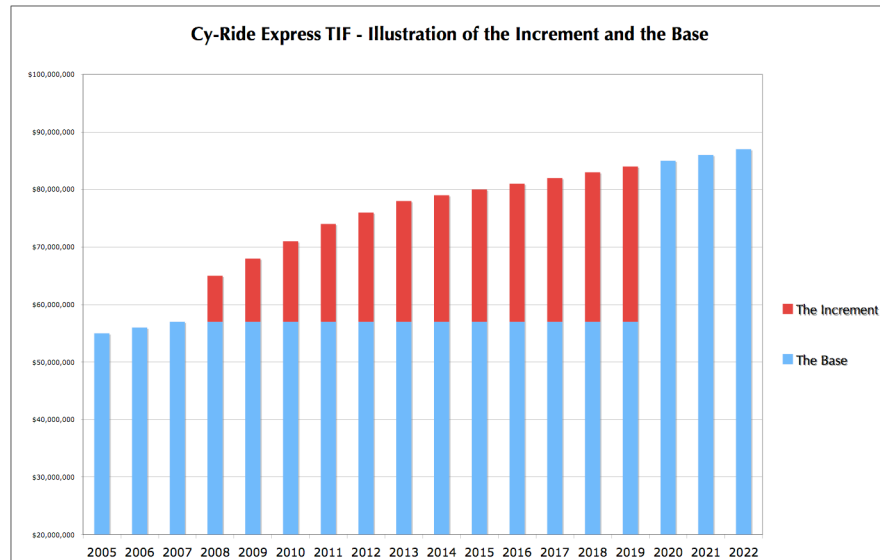


Figure 9: Theoretical “base” and “increment” property valuation levels

When the TIF is implemented in 2007, the “base” (the valuation of land in the district that is taxed to support general revenues) does not increase until the TIF expires. The “increment” (the valuation of the land above the “base” that is taxed to pay for capital improvements) increases until 2020.

During 2020, the point at which Cy-Ride Express is hypothetically paid off, the entire property valuation reverts back to the “base.”

Other local sources of capital funding exist as well. The University and City of Ames each have multi-million dollar capital improvement projects budgets, and this project, if deemed worthy, could be added to those capital improvement schedules. The Government of the Student Body has a budget of approximately \$100,000 devoted to capital improvement projects. Private donations could be sought through the Iowa State University Foundation and by the City of Ames. Selling excess buses in Cy-Ride’s fleet could raise approximately \$22,500 (Bourne, 2005). Finally, Ames residents have approved property tax bonds in the past to fund public investment projects of this cost. Property tax bonds could be used to reduce the length of time the TIF would be in effect.

Revenue Source	Estimate
Iowa State University General Fund	\$500,000
Private Support (ISUF, City of Ames)	\$500,000
City of Ames CIP Reprioritizing	\$500,000
MSCD Tax Increment Financing District	\$4,142,900
Cy-Ride Bus Sale	\$22,500
Government of the Student Body	\$50,000
Community Attractions and Tourism Grant	\$1,750,000
Total Revenue	\$7,465,400

	High Estimate	Low Estimate
Expenses	\$8,835,000	\$7,465,400
Revenue	\$7,465,400	\$7,465,400
Other sources (e.g. add'l TIF revenue or property tax bond)	\$1,369,600	None

Table 5: Capital revenue & expenditures summary

Operating Expenditures

Although local share of capital expenses can be mitigated through funding programs, each community usually assumes the burden of operating expenses.

Approximately 66% of Cy-Ride is paid for using local revenues (Bourne, 2004). A

number of factors unique to Ames would enable Cy-Ride Express to limit operating costs to an affordable level.

A. Operating Costs – Cy-Ride Revenue Hour Reduction

First, fixed-rail would completely replace an existing bus route, the Orange Route. The Orange Route requires 17,553 revenue hours to operate; Cy-Ride's total fixed-route operating revenue hours equal 98,616, meaning that the Orange Route accounts for approximately 17.7% of Cy-Ride's total fixed-route operating expenses, or \$708,000 (Davenport, 2005). In addition, duplication in service with the existing Red and Green Routes and Cy-Ride Express would mean that bus revenue hours needed to provide equivalent service could be reduced significantly from current levels. The Red and Green Routes currently require 36,470 revenue hours to maintain current service levels. Equivalent service provided by Cy-Ride Express would mean that revenue hours could probably be reduced by 25% to 33%, equaling savings of \$250,000 to \$333,000 (Davenport, 2005). These already existing revenue streams could be used to fund Cy-Ride Express.

By replacing the Orange Route with fixed-rail, cost savings would not only be limited to what is achieved by eliminating the Orange Route. The vehicles used in Portland have a capacity of 149 passengers, significantly higher than what is possible on Cy-Ride's existing fleet of 40-foot buses, which have 70-passenger capacities. Use of a higher capacity vehicle will significantly reduce the number of vehicles necessary to carry the same volume of passengers, thereby reducing the workforce required. Wages, salaries and benefits are the most significant contributor to operating costs, so a reduction in this area is not insignificant. According to figures provided by Cy-Ride, using vehicles

with a capacity of 149 passengers would reduce revenue hours by at least 39.47%, or 6,921 revenue hours (Davenport, 2005). Within Cy-Ride’s existing operating cost structure, that translates into an immediate savings of \$280,725. In addition, by using a more direct route with fewer stops than the existing Orange Route, total running time to complete a trip from the Park and Ride facility to Central Campus and back might be reduced relative to the existing Orange Route, potentially further lowering operating costs. The use of the smaller-capacity vintage trolleys precludes any similar cost savings with that section of Cy-Ride Express. Assuming 2 vintage trolleys are used during peak hours while the university is in session, which would result in service intervals of around 15 minutes or less, total revenue hours are estimated to be approximately 6,500 revenue hours, for a total Cy-Ride Express revenue hours estimate of 17,112 hours.

B. Operating Costs – Cy-Ride Efficiency Analysis

Cy-Ride operates an extremely efficient bus service. As shown in table 6, Cy-Ride operates its buses at a significantly reduced average expense relative to all the four of the cities studied that have recently constructed streetcars.

Source: Federal Transit Administration

	Portland	Tampa	Memphis	Kenosha	Cy-Ride
Operating expense per vehicle revenue hour (bus)	\$91.01	\$59.62	\$104.51	\$74.59	\$46.78

Table 6: Cy-Ride and comparison cities’ bus operating expenses

Because salary, wages and benefits are a significant portion of operating expenses, it is reasonable to assume that some of Cy-Ride’s operating efficiency could be similarly duplicated if Ames implemented Cy-Ride Express.

	Portland	Tampa	Memphis	Kenosha	Cy-Ride
Salary, Wages and Benefits	\$175,910,052	\$24,541,216	\$33,909,941	\$3,972,587	\$3,452,457
Total Operating Expenses	\$245,119,523	\$33,513,235	\$46,919,279	\$5,601,399	\$4,716,154
Personnel as a percentage of Total Operating Expenses	71.77%	73.23%	72.27%	70.92%	73.20%

Table 7: Personnel expenses as a proportion of total operating expenses

Among the comparison cities studied, salaries, wages and benefits are always approximately 70% of the total. Therefore, the most substantial source of variation in the cost of operating a transit system is the salary, wages and benefits needed to pay to employees running it. Cy-Ride employs 146 workers and enjoys access to the large pool of inexpensive labor available at Iowa State University. Thus, if it is assumed that a significant portion of operational costs savings exhibited by Cy-Ride could be reproduced if Cy-Ride Express was implemented, the ratio in streetcar operating expense and bus operating expense for the other cities, which all have both bus and streetcar service, can be used to predict the relative operating expense of streetcar service in Ames based on Cy-Ride’s bus service.

Source: Federal Transit Administration, Portland Streetcar, Inc.

	Portland	Tampa	Memphis	Kenosha	Cy-Ride Exp.
Operating expense per vehicle revenue hour (streetcar)	\$115.00	\$106.43	\$92.73	\$106.49	\$62.73 (estimate)
Operating expense streetcar/operating expense bus	1.264 (115.00 ÷ 91.01)	1.785 (106.43 ÷ 59.62)	0.887 (92.73 ÷ 104.51)	1.428 (106.49 ÷ 74.59)	1.341
Average proportion: operating expense streetcar/operating expense bus	1.341 ([1.264 + 1.785 + .887 + 1.428] ÷ 4 cities)				N/A

Table 8: Operating expense bus/streetcar average expense analysis

Based on the four comparative models, the mean streetcar operating expense/bus operating expense ratio is 1.341. Thus, to operate a streetcar, it costs an average of 1.341 times the operating cost of a running a bus for an equivalent distance. The range in operating expenses ratios runs from 1.785 in Tampa to .887 in Memphis, where it is actually less expensive to operate their streetcar compared to their average operating cost to run a bus. If, as in the other comparison cities, the cost to operate a streetcar in Ames is about 1.341 times the cost to operate equivalent bus service, then the estimated cost per vehicle revenue hour for Cy-Ride Express is \$62.73, or 1.341 times the cost of equivalent Cy-Ride bus service.

C. Operating Costs – Itemized Expenses

With detailed, itemized operating expense reports available from Portland, it is possible to predict operating costs for Cy-Ride Express, taking into account differences in operation and environment. Table 9, shown below, summarizes estimated revenue hours required for operation.

	Portland	Cy-Ride Express	Percent	Calculation
Revenue hours	21,020	17,112	81.40%	10,612 estimated for commuter lots/campus 6,500 estimated for Main Street/campus
Operational wages	\$1,337,021	\$1,088,444	81.40%	\$1,337,021 * 81.40% =

Table 9: Cy-Ride Express revenue hours operating expense reduction

Now, after taking into account the reduced revenue hours required to operate Cy-Ride Express, other operating costs are estimated based on the Portland Streetcar. Three different assumptions are used to arrive at a maximum, high and low estimate of operating costs.

Maximum Expense Estimate

- No operational savings will occur in Ames relative to Portland.

The maximum estimate is calculated based on the assumption that there will be no cost savings in either operational or administrative wages, benefits or salaries in Ames compared to Portland. This estimate is significantly higher than what the actual costs would be because, as Cy-Ride demonstrates, labor costs required to operate transit systems are significantly lower in Ames than in Portland and other communities.

High Expense Estimate

- Operational savings in Ames relative to Portland will be 11.5%.

The high estimate is calculated based on the difference in average operating costs for the other systems studied relative to Portland, which has the highest operational costs of any of the fixed-rail systems in the study group. This ratio is then applied to the itemized operating costs calculated from Portland with the assumption that there are costs unique to Portland that do not exist elsewhere and that it is likely that Ames' operating expenses will be lower than Portland's, just as the other cities' rail systems are. Therefore, with the high estimate, Portland's itemized personnel operating expenses are adjusted down by 11.5%.

Low Expense Estimate

- Operational savings in Ames relative to Portland will be 45.5%.

The low estimate is calculated by assuming that the ratio of operating expense per vehicle hour is an accurate predictor for multiple transit modes within the same city (i.e. if it is less expensive to operate a bus in a certain city, then it will be less expensive to operate a streetcar as well). This ratio was calculated and explained in section B "Operating Costs – Cy-Ride Efficiency Analysis," above. With the low estimate, Portland's personnel operating expenses are adjusted down by 45.5%.

These estimates also do not take into account any administrative and maintenance synergy between Cy-Ride and Cy-Ride Express, which would further reduce costs below the estimates provided.

Source: Portland Streetcar, Inc.

	Maximum Estimate	High Estimate	Low Estimate
Operational Employees	\$1,088,444	\$963,272	\$593,202
Administrative Employees	\$496,000	\$438,960	\$270,320
Maintenance	\$493,818	\$493,818	\$493,818
Total Costs	\$2,078,262	\$1,896,050	\$1,357,340

Table 10: Itemized operating expense estimates

While operating costs almost certainly will not be as high as the high estimate indicates, it is possible that costs could be reduced even further than the low estimate. The Dallas McKinney Avenue Trolley, a 3.6-mile route near downtown Dallas, Texas, provides an intriguing example of operating cost savings that may be similarly duplicated in Ames. The McKinney Avenue trolley is almost completely operated by *volunteers*. The Vintage Trolley concept has been so popular and well-received in Dallas that an entire philanthropic organization sprung up to supply financing and a workforce to operate the trolley line, which runs seven days a week. The McKinney line actually operates free of public subsidy (APTA, 2004). Charlotte, North Carolina recently constructed a \$16.7 million, 2-mile vintage trolley line. “Charlotte Trolley, Inc. has provided over 14,500 hours of volunteer service” to support the operation and administration of the trolley line (Charlotte Trolley, 2004). With the portion of Cy-Ride Express running along portions of the old Dinkey and streetcar routes, the historical and nostalgic significance of fixed-rail in Ames would be no less in Ames than in Dallas or Charlotte. I believe volunteer labor and private funding could be secured in Ames, too, for the portions of the streetcar that would run from campus to the Main Street Cultural District, potentially saving hundreds of thousands of dollars in expenses.

In addition to the existing bus service cost and efficiency savings noted above, other obvious sources of funding exist that could be tapped if fixed-rail was implemented. Advertising and sponsorships along other streetcar and historic trolley routes have successfully raised revenue and attracted advertisers not interested in advertising on existing bus systems. A similar program in Ames could attract Main Street businesses, for example, and perhaps raise \$30,000 annually. Additional revenue could be produced by requiring permits for students and others using the Iowa State Center commuter lot (and subsequently riding Cy-Ride Express to travel to campus). Assuming 6,000 permit holders, charging \$45 for an annual permit could raise \$270,000, which is justified based on the enhanced regularity and comfort that fixed-rail transit would provide. Single day users could be accommodated by providing inexpensive visitor pay-per-hour parking adjacent to the Park and Ride facility. If this is combined with price increases for pay-per-hour parking in other lots near Central Campus, at least \$15,000 could be raised.

Revenue Source	Estimate
Cy-Ride Orange Route elimination	\$708,000
Cy-Ride Red and Green Route reduction	\$290,000
Advertising	\$30,000
Commuter Lot Permits	\$270,000
Pay-Per-Hour Parking	\$15,000

Total Revenue	\$1,313,000
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	Maximum Estimate	High Estimate	Low Estimate
Expenses	\$2,078,262	\$1,896,050	\$1,357,340
Revenue	\$1,313,000	\$1,313,000	\$1,313,000

Govt. Subsidy Required	\$765,262	\$583,000	\$44,340
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Table 11: Total operating expense and revenue estimate

Thus, even assuming no fares are collected, no volunteer labor is used, no cost savings is achieved by sharing resources between Cy-Ride and Cy-Ride Express, Ames could implement fixed-rail for only \$50,000 in additional government support, as long as Cy-Ride can operate streetcars as efficiently as it runs its buses. Even in the worst-case scenario in which there is zero operational costs savings in Ames relative to Portland, Cy-Ride Express could be implemented for approximately \$750,000 in additional annual government subsidy, an increase of just 21% from current levels.

Operating and Capital Expenditures Summary

Capital Expenses:

Revenue Source	Estimate
Iowa State University General Fund	\$500,000
Private Support (ISUF, City of Ames)	\$500,000
City of Ames CIP Reprioritizing	\$500,000
MSCD Tax Increment Financing District	\$4,142,900
Cy-Ride Bus Sale	\$22,500
Government of the Student Body	\$50,000
Community Attractions and Tourism Grant	\$1,750,000

Total Revenue	\$7,465,400
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	High Estimate	Low Estimate
Expenses	\$8,835,000	\$7,465,400
Revenue	\$7,465,400	\$7,465,400
Other sources (e.g. add'l TIF revenue or property tax bond)	\$1,369,600	None

Notes: Capital expenses would increase if unforeseen bridge modifications are necessary at the 6th Avenue viaduct, the 6th Avenue Union Pacific underpass or the Main Street/Grand Avenue bridge, or if extensive utility relocations are necessary. Expenses would decrease if vehicles bought in bulk orders are purchased for reduced price.

Operating Expenses:

Revenue Source	Estimate
Cy-Ride Orange Route elimination	\$708,000
Cy-Ride Red and Green Route reduction	\$290,000
Advertising	\$30,000
Commuter Lot Permits	\$270,000
Pay-Per-Hour Parking	\$15,000

Total Revenue	\$1,313,000
---------------	--------------------

	Maximum Expense	High Expense	Low Expense
Expenses	\$2,078,262	\$1,896,050	\$1,357,340
Revenue	\$1,313,000	\$1,313,000	\$1,313,000

Govt. Subsidy Required	\$765,262	\$583,000	\$44,340
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Notes: Revenue would increase if fares are charged. Expenses would decrease if volunteer labor is used and/or asset & personnel sharing with Cy-Ride is implemented.

Given the diversity of funding sources available to pay reasonable one-time local capital costs and considering the operating efficiencies gained by moving to fixed-rail technology, it appears almost certain that Cy-Ride Express would be a comfortably feasible public investment project for a city such as Ames. Would the benefits of Cy-Ride Express exceed its costs? Unfortunately, as I will discuss below, not many of the potential benefits that can be derived from implementing fixed-rail are easily quantifiable. However, some improvements, such as environmental emissions reductions, are logically predictable. And there is plenty of anecdotal evidence to suggest substantial benefits of fixed-rail in difficult to predict areas such as economic development and tourism.

Cy-Ride Express: Bringing Ames Together Again

Social Capital

Overall, the perception in Ames is that students dislike and distrust the permanent residents of Ames and the permanent residents feel the same way towards students. This phenomenon, which has become starkly evident in the last few decades, is a microcosm of a greater trend simultaneously affecting our nation as a whole: the decline of social capital. Social capital, defined as “the social networks and interactions that inspire trust and reciprocity among citizens” (Leyden, 2003) is virtually non-existent in Ames, except within the predominant dual classes of citizens that live here, the students and the permanent residents. There are hundreds of student organizations whose membership is exclusively students, alongside at least an equal number of formal and informal organizations that are exclusively comprised of permanent residents. In fact, no community-wide improvement organization exists in Ames that attracts significant numbers of students and permanent residents alike. Students and permanent residents

have even established separate, parallel government structures. Despite making up half of the community's population, students haven't had voting representation on the city council for at least 50 years, if ever (Tedesco, 2005). No one represents the permanent residents of Ames on the Government of the Student Body. This lack of cooperation is a strong indication that, generally, students typically care only about their lives and their spaces while permanent residents typically only care about their lives and their spaces.

The paucity of social capital bridging Ames' deepening class divide has seriously damaged our community. In general, empirical studies have shown that increased social capital is associated with better physical and mental health, the proper functioning of democracy, prevention of crime and enhanced economic development. But Ames' social capital deficiency is evident in more specific ways, manifesting itself in extreme incidents such as the most recent VEISHEA riots. Can anyone doubt that if the people who threw rocks at police had previously met and interacted with a police officer in a positive and meaningful way, inspiring trust and reciprocity, that they would have been less likely to launch a stone? Common sense suggests that if a person knows and admires a person they might unknowingly be throwing a rock at, they'll think twice. Or, on a broader scale, imagine if the onlookers who enabled the most serious offenders to act actually felt ownership of Ames and that they were members of the community that was being attacked. Would they have acquiesced to the rampant and senseless destruction of the infrastructure of their city? Would they still have found it entertaining?

Although VEISHEA rioting is an extreme, but infrequent, example of social dysfunction, Ames' lack of social capital manifests itself on an everyday basis. It is evident when an irresponsible student throws a large off-campus party that risks damage

to a neighbor's property and keeps their kids awake. It is evident when students' complaints regarding the police are an everyday lunch topic. It is evident when the City Council feels compelled to pass an ordinance prohibiting couches on front porches of rental houses. It is evident when neighborhood organizations are comprised of one class, permanent residents, and work to the detriment of the other. It is evident when apartment communities explicitly exclude undergraduates. It would be naïve to claim that conflict isn't inherent between students and permanent residents of college towns, due to the differences in goals, backgrounds and circumstances innate in each class. The 2004 VEISHEA Task Force noted that disturbances were first recorded in university/town settings hundreds of years ago. However, it is not difficult to see that Ames' social capital divide, that all but eliminates trust and reciprocity between students and permanent residents, is worse than it should be, and it's getting worse all the time. A crisis exists in Ames, and it deserves the attention of every one of us. This crisis is not just a result of the fractious nature inherent in any town-gown relationship; it is exacerbated and enhanced by the current physical structure of Ames itself.

Social Capital and the Physical Structure of Ames

The physical structure of Ames is constantly changing and evolving, as it has since its establishment in 1864. Yet while the university remains the center of activity in Ames, the community surrounding the university, providing housing, services and entertainment for the university population, has shifted since the university's inception. Specifically, in the 20th century, these changes led to dramatic shifts in the distribution of Ames' college population.

Originally, Ames' downtown provided all of the services required to support the Iowa Agricultural College's population. Main Street, and the area surrounding it, used to

contain the residences of the entire university population, including all of its fraternities and sororities, which existed downtown until nearly 1930. In addition, the downtown area contained essential businesses peripheral to and necessary to carry out university activities, including providing meeting space for professional meetings. The Sheldon-Munn hotel, which opened in 1916, provided space for events, such as fraternity and sorority social gatherings, closely associated with the College, which had no Memorial Union. Brown's excellent historical work, *Ames: The Early Years*, documents extensively how social capital used to exist in surfeit between the students and permanent residents of Ames. From Tilden's grocery and department store, shared local churches, and Memorial Day parades, to the Ames passenger rail depot, students and permanent residents shared the same space and there were plenty of opportunities for development of social capital.



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Figure 10: ISC Students, located in front of the current Landscape Architecture building, seen walking towards downtown in order to participate in St. Patrick's Day Parade

Surprisingly, the students pictured in figure 10 that were involved in an obviously large civic demonstration were not eventually tear-gassed.

The critical significance of downtown to the College's population began to disappear with the advent of two major changes that forever altered Ames, precipitating a decline in social capital and a transformation from the early years in which students and permanent residents shared space. The first, the construction of paved roads and widespread personal automobile use, began in approximately 1920, with the completion of the first all-weather paved road between campus and the historic core of Ames. The second was the extension of utility services, such as water, sewer and electricity, to the area surrounding the College's campus, known as the Fourth Ward; this area was not annexed into the City of Ames until 1892. The extension of services led to development of what is known today as Campustown, centered in the area along Welch Avenue and home to numerous student-occupied residences and businesses catering to students' preferences.

Thus, a dramatic transformation of the physical relationship Ames had with the College's students commenced in the early 1920's. While the academic work of the university had always been carried out on campus, many of the peripheral activities associated with the university were embedded within the infrastructure of the historic core; students, faculty and townspeople shared the same space. With the development of Campustown housing and student-centered businesses, and the further concentration of students residing in on-campus university-provided housing, the necessity for students to live downtown or patronize business located there evaporated. The result, which became progressively more evident from the 1920's until the 1980's, was a stark separation between the students (and businesses and public spaces catering to students), and the permanent residents of Ames (and businesses and public spaces catering to them). As a

result, social capital and interaction among students and the permanent residents of Ames declined significantly.

Today, Ames is experiencing another important shift in the distribution of students. No longer are students choosing to reside almost exclusively in Campustown or locations near or on campus. With the decline in the percentage of students living in university-provided housing, and a corresponding increase in demand for off-campus housing, the construction of apartment units around Ames has exploded. Hundreds of new units have been constructed in various locations around Ames, with much of the development occurring far away from campus. A primary reason for this is the development of Cy-Ride, which efficiently and cheaply provides regular transportation directly to and from the University's Central Campus, in addition to the development of the free park and ride facility that allows anyone with an automobile quick access to Central Campus. While this dispersal of students around the community appears not to have impacted the MSCD, positively or negatively, there have been anecdotal reports that the reduction in students living on-campus may have weakened the business climate in Campustown by decreasing pedestrian traffic along Welch Ave. This decline in the importance of Campustown as a center of student activity limits opportunities for developing social capital among students themselves, with many distant apartment communities lacking any kind of public space, such as coffee shops, retail stores or bars. Interaction between students and the permanent residents of Ames has not increased, either, with apartment complexes strictly separated from single-family housing in which many of Ames' permanent residents reside.

Ames' current path is leading to a future in which disconnected students reside in generic apartment buildings far away from campus, perhaps regularly interacting only with their roommates, using their automobile for transportation and rarely, if ever, having a reason to meet and learn from a permanent resident of Ames, thereby contributing nothing to the community fabric of greater Ames. The current path is leading to a future in which the only potential for social capital development between students and the permanent residents of Ames occurs when interaction is forced, such as when police confront students. In what space, and for what reason, will students otherwise interact with the permanent residents of Ames? In the parking lot at Target? In the checkout line at Hy-Vee? At City Hall where no students vote on the council? At the Government of the Student Body Senate meetings where no one from the community shows up? Doubtful. Interestingly, current trends in the development of Ames are leading to a future in which not only does minimal social capital exist between the permanent residents and students, it is leading to a future in which little social capital is developed off-campus within even the student body itself. Alternatively, by renewing the physical connection between Ames' historical core and Iowa State University, we can take steps towards renewing the tie between the city and its students and redeveloping some degree of social capital that has been lost. While no single solution will be sufficient to address this problem and all of its manifestations, this study suggests that Cy-Ride Express may provide an important first step.

How Cy-Ride Express Could Help Develop Social Capital

While the powerful metaphoric significance of reconnecting Main Street and campus with fixed-rail should not be diminished, published research supports the assertion that place and developmental sprawl are significant contributors to social capital

decline, and that by promoting the development of districts like the MSCD we can reverse this decline. “Pedestrian-oriented, mixed-use neighborhoods ... enhance social capital because they enable residents to interact. In contrast, most contemporary subdivisions [such as the new apartment complexes rising up all over Ames] do little to enable social interaction” (Leyden, 2003). A 2003 study conducted in a similarly sized city to Ames and published in the American Journal of Public Health conclusively demonstrated that “persons living in walkable, mixed-use neighborhoods have higher levels of social capital compared with those living in car-oriented suburbs. Respondents living in walkable neighborhoods were more likely to know their neighbors, participate politically, trust others, and be socially engaged” (Leyden, 2003). Ideally, aren’t those among the qualities we should desire to instill in our young adults in Ames? Why is it, then, that Ames has chosen to encourage the development of housing for its students that has been convincingly shown to discourage the development of each of these qualities? It should be no surprise that students don’t participate in Ames’ political process, don’t trust the permanent residents of Ames to look out for their best interests, and decline to be socially engaged in the greater community. Students, due to generational differences, are already predisposed towards these behavioral patterns. Ames’ response, sadly, has not been engagement; rather, it has been separation. With a *physical* and generational divide now separating Ames residents from students, “place-based social capital is being supplanted by function-based social capital. We are withdrawing from those networks of reciprocity that once constituted our communities.” In Robert Putnam’s famous book, *Bowling Alone*, he notes “sprawl has been especially toxic for bridging social capital”

(Putnam, 2000). Bridging social capital, or social networks and interactions that extend across class boundaries, is exactly what Ames most desperately needs.

How could Cy-Ride Express begin to reverse this decline in place-based social capital? Picture the Main Street Cultural District with a resurgence of residential units. Older undergraduates, graduates and young professionals all choose to live downtown or near downtown to be close to easily accessible rapid transit to campus, a wide variety of evening venues such as restaurants and night clubs, public spaces such as the downtown community center, urban parks and everyday coffee shops, and daily necessities, such as grocery stores. All of these amenities would be within walking distance, encouraging MSCD residents to contribute to a lively, pedestrian-oriented urban atmosphere in which chance encounters frequently occur, place-based social capital is developed and students and permanent residents alike feel a real ownership of place. Picture a Main Street Cultural District in which casual users ride the streetcar from campus to Main Street over the noon hour and in between classes, seeking out a diverse set of unique and inexpensive eateries and quiet, relaxing places to study while people-watching the pedestrian activity outside. Picture a Main Street Cultural District that is once again a center of university-peripheral activity that invites students to share public space with the permanent residents of Ames, enabling both students and permanent residents to interact and observe each other in a positive sense, and not through the distorted lens of the Ames Tribune's police reports or the City Council's anti-student ordinances. The opportunity and potential that exists in the Main Street Cultural District is huge, but it cannot be tapped unless the physical connection with the university, the city's center of activity, is reestablished.

Cy-Ride Express: Economic Development Impacts

An often-touted benefit associated with implementing modern streetcar systems is economic development. In each of the case study cities, Kenosha, Memphis, Portland and Tampa, the effect of fixed-rail has been significant. In Portland, for example, some developers are now insisting on extensions of the streetcar line to their urban redevelopment projects as part of their building agreements with the city.

The streetcar's ability to leverage private investment is nowhere more evident than in Portland, where a streetcar line was built in 2001 to connect two vacant, 120-acre parcels north and south of downtown. Since then, about 4,600 housing units and 2.2 million square feet of commercial development have been built to the north in the Pearl District, within two blocks of the line, achieving the entire city's 20-year housing goal in just seven years. Rick Gustafson of Portland Streetcar, Inc., says another 5,000 housing units are expected to be built south of downtown over the next five to 10 years. "When we started talking about a goal of 5,000 units in 1988, it was laughable," says Gustafson, who also heads the National Streetcar Coalition. "There was no market for this kind of development" (Ohland, 2004).

Tampa has also seen increased development interest in downtown properties that locals attribute to its historic trolley.

In Tampa, Florida, a 2.5-mile-long streetcar line has been a catalyst for \$600 million worth of development, including 4,000 residential units, according to Ed Crawford of the Hillsborough Area Regional Transportation Authority. The streetcar connects downtown with the historic Ybor City neighborhood and with Channelside, a new loft and high-rise residential and entertainment district. "Suddenly all these disparate places have become part of someplace," says Crawford. "The streetcar has been an exercise in place making" (Ohland, 2004).

Finally, Kenosha, the community most similar to Ames out of the four communities studied, has also seen a sudden increase in downtown redevelopment as a result of its \$4 million streetcar investment.

Perhaps the most surprising success story is Kenosha, Wisconsin, where a streetcar line has spurred redevelopment of a 70-acre brownfield in the heart of downtown. . . . "We built the streetcar because we needed something to attract developers," says Ron Allen of the Kenosha Transit Commission, "and they came running." At 15 dwelling units per acre, the 400 new condos and townhomes are "high-density by local standards," says Allen, and are selling as fast as they can be built (Ohland, 2004).

While predictions of similar economic development being attracted to downtown Ames are difficult to make with certainty, common sense suggests that with rapid transit available from downtown to Central Campus, students and young professionals would be interested in living downtown. Those living downtown would frequently patronize a business community that is now almost completely dependent on automobile traffic, but was designed and constructed to serve pedestrian clientele. Certain existing businesses, such as Wheatsfield Grocery, Jimmy John's or neighborhood pubs such as 212 Main would be direct beneficiaries of additional downtown residents. Assuming a significant number of housing units are constructed in or near the Main Street Cultural District, such as in underutilized parcels on 5th and 6th Streets, pedestrian activity downtown could increase dramatically, adding to a livelier and more distinctive feel to the area. The presence of renewed, aesthetically attractive development downtown would add to the area's physical character, giving visitors from suburban and rural Iowa a taste of urban, pedestrian-oriented architecture, while carefully preserving the historic quality of the Cultural District. These new structures could open new first-class office and retail space that currently isn't available, perhaps attracting retailers typically found in chic downtowns, such as Starbucks or The Gap, or inspiring local retail and entertainment business owners to invest additional money downtown, opening new spin-offs of their current businesses. In addition, with Cy-Ride Express connecting the Cultural District

with the University, downtown businesses would benefit from weekday visits from students, faculty and staff, looking for fresh new places to eat, a quiet place to study, or a place to sit and people-watch.

Cy-Ride Express, based on the experience of the other cities studied, would likely attract housing development and increase traffic downtown through improved accessibility. By increasing housing and accessibility downtown, corresponding growth in area retail and entertainment offerings would soon follow. The sort of infrastructure/capital improvements-driven economic development evident in other cities, such as Kenosha or Tampa, which would also occur in the MSCD, implies that a MSCD tax increment financing district, as suggested earlier in this report, is a logical and practical means to raise revenue for capital costs associated with Cy-Ride Express.

Cy-Ride Express: University Impacts

Cy-Ride Express could potentially be a major asset to Iowa State University. Not only would current students, faculty and staff enjoy the convenience, enhanced mobility and access to the Main Street Cultural District that Cy-Ride Express would provide, it could also be a selling point in student and faculty recruiting. Much of Iowa State's student and faculty population comes from places that are dramatically different than Ames. Many are from rural communities throughout the Midwest; many others are from overseas urban environments. Cy-Ride Express would enable Iowa State to offer public transit options and an atmosphere similar to urban areas, while preserving the positive attributes that big cities lack: low crime and easy mobility. Student and faculty recruiting visits could incorporate a ride on the vintage trolley to downtown to visit restaurants and other venues. Iowa State would have an unparalleled advantage compared to most other

Midwest research institutions in recruiting those either unable or unwilling to use automobile transportation. In addition, both Ames and Iowa State could showcase the community's commitment to environmental protection, because fixed-rail systems release zero emissions.

Cy-Ride Express: Tourism and Convention Impacts

According to the Iowa Department of Economic Development, tourism related expenditures in Story County reached \$120,660,000 in 2003 (IA IDED, 2004).

Meanwhile, the Iowa State Center, the University, Reiman Gardens and the Main Street Cultural District are the primary tourism draws in Ames. A historic trolley that connects all of these destinations could be a tourism draw in and of itself:

- Events and attendance at the Iowa State Center and Jack Trice Stadium could be enhanced by physically connecting those venues with the rest of Ames. Many communities, such as Minneapolis, Des Moines or Omaha, have constructed concert, conference centers and sporting venues in their downtown cores. At least part of the reason for locating these facilities downtown is so that the surrounding areas can benefit from the pedestrian and automobile traffic generated by the events held. The Iowa State Center and Jack Trice Stadium are located in a flood plain and no retail and entertainment businesses that would normally seek to locate near such entertainment venues can be developed. By implementing Cy-Ride Express, the Iowa State Center could be integrated into the greater community. The athletic department, for example, could sponsor promotions that link food establishments downtown, such as Olde Main Brewery, with men's basketball games. The Cultural District could coordinate special events,

promotions and rallies with home football games. Users riding the rails to arrive at a Jack Trice Stadium football game could enter and exit the vicinity as fast as anyone using a car, and would have the added benefit of enjoying entertainment and retail downtown. Downtown nightclubs could advertise specials to coincide with major concert events. The existence of the rail service itself would likely draw additional patrons to Iowa State Center events, such as families with children that would be entertained by the novelty of the rail service and interested in the historical connotations of Cy-Ride Express. It seems likely that Cy-Ride Express would not only be a unique addition to the Iowa State Center experience but it would likely be a financial positive for the Center as well, considering the additional incentive private business, such as those seeking to tie their businesses to athletic department events, would have in promoting Iowa State Center events to draw patrons to their own businesses.

- Cy-Ride Express would connect Ames' principle collections of art: the Octagon Center for the Arts, the Iowa State Central Campus, Brunner Art Museum and the forthcoming renovated Morrill Hall.
- Cy-Ride Express would connect all of Ames' greatest historical treasures, including historic campus structures, such as the Farmhouse, with historic sites on Main Street, like the old rail depot or the Sheldon-Munn building.
- In recent years, city and university officials have worked hard to capitalize on the unique convention infrastructure the city, University and Iowa State Center offer. For many of these conventions, Cy-Ride is used to shuttle attendees throughout the campus, particularly between the residence halls and convention facilities

concentrated at the Iowa State Center. Cy-Ride Express would be a logical enhancement in Ames' convention offerings, giving visitors a more efficient and interesting mode of transit, in addition to linking these conventions with the entertainment and restaurant offerings of the Main Street Cultural District. In short, conventions such as the National Special Olympics and the Boy Scouts Order of the Arrow, which are already well served by Ames' infrastructure, would be tempted to return to Ames for years and years to come.

By being able to showcase Ames' convention infrastructure, entertainment, cultural, historical and artistic offerings as a cohesive unit, the sum undoubtedly will exceed the parts.

Conclusion

This study establishes that it is financially and practically feasible to implement fixed-rail in Ames. At the same time, fixed-rail could address a wide range of issues in the community that deserve our attention, such as the growing division between the permanent residents and students or the stagnant economic development in the Main Street Cultural District. The costs appear manageable. The possibilities are exciting. The student, city, University and business leaders of Ames should examine further the potential for fixed-rail transit.

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