Rondo Land Bridge

Health Impact Assessment (HIA) Summary and Additional Community Insights

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Executive summary

In 2017, ReConnect Rondo, in partnership with Saint Paul – Ramsey County Public Health, conducted a Health Impact Assessment (HIA). The HIA process was used to engage residents in efforts to consider the potential impacts of a land bridge on community health and well-being, and bring forward new information to inform decisions made by the Minnesota Department of Transportation about whether a land bridge in the Rondo neighborhood will be a component of improvements made along the Interstate 94 (I-94) corridor. Conducted as a capstone project by three University of Minnesota graduate students (Hoveland, Hoffman, and Jerome, 2017)), the project made helpful and important contributions to the conceptualization of a land bridge, but was not without limitations. This process is one tool in a decades-long effort to revitalize and restore a thriving Rondo neighborhood after it was torn apart with the construction of I-94 in the 1960s. Findings and recommendations from the Rondo land bridge HIA are presented here, as well as findings and recommendations from more recent studies and community engagement activities. The intent of this report is to inform decision-makers about community concerns and desires and to help set priorities to be addressed in the planning process for a land bridge.

Health Impact Assessment (HIA) key findings and recommendations

While many issues surfaced as community concerns and desires, the HIA committee selected the following three topics as primary focus areas for this HIA: **green space**, **opportunities for physical activity**, and **local economy**. Recommendations were developed through the HIA to mitigate potential negative health impacts and optimize community well-being.

Focus area	Findings	Recommendations
Green space	Overall, the work completed by Hoveland, Hoffman, and Jerome (2017) concluded that increased green space was likely to improve mental health and well-being for individuals closest to the land bridge or who regularly use the space. They also concluded there was low likelihood for changes in asthma or cancer among Rondo residents and that potential for changes in injury were uncertain. The authors drew these conclusions based on a review of relevant studies.	• Design the green space on the land bridge with the community, specifically youth and elders, to ensure future utilization. It should include: – A portion dedicated to urban agriculture – Public art commemorating the history of the Rondo neighborhood – Key components of Crime Prevention through Environmental Design (CPTED) theory – A diverse range of plant and tree species to increase canopy coverage • Create a local nonprofit focused on programming on the land bridge, particularly youth programming • Increase street cleaning on streets with an increase in boulevard trees to avoid clogged sewers and flooding • Establish permit-parking only areas around the new green space to limit parking problems and encourage the use of public transit • Work in partnership with the Capitol Region Watershed to increase storm water capacity in the neighborhood • Explore new technologies to clean emissions and reduce noise in the tunnel created by the land bridge

Focus area	Findings	Recommendations
Physical activity	The assessment concluded that a land bridge was likely to lead to greater opportunities for physical activity and very likely to have a positive impact on reducing obesity rates among people closest to the land bridge and who use it regularly. They concluded there is a low likelihood of residents experiencing positive change in asthma and cancer rates and rated changes in mental health as "possible" but requiring additional data.	• As part of the land bridge design, include programming and amenities designed to increase neighborhood physical activity (e.g., sports fields, playground equipment) • Increase pedestrian connections across the freeway • Integrate the Rondo neighborhood into the Saint Paul Bicycle Plan • Zone Rondo as a dense, mixed-use neighborhood where residents can easily walk or bike to reach goods and services
Local economy	The assessment concluded that, depending on the types of policies enacted, a land bridge could have positive or negative impacts on the economic stability of current Rondo residents and related mental health and chronic disease outcomes.	• Establish a community benefits agreement (CBA) between developers, community members, Minnesota State Government, and the City of Saint Paul focused on inclusiveness and accountability throughout the negotiation and development process • Utilize inclusionary zoning and neighborhood planning tools to increase the amount and diversity of affordable housing types in the neighborhood • Expand support for local businesses and entrepreneurs through City funding streams and nonprofit business support organizations • Reserve legitimate decision-making participation opportunities for community members

It should be noted that, as with any HIA, some descriptive information, as well as health and well-being measures, of interest to the HIA Community Advisory Committee were not readily available. For some types of data relevant to the HIA (e.g., health behaviors, measures of mental health), estimates had high margins of error at the neighborhood level, while other types of information (e.g., neighborhood cohesion) can only be gathered through new data collection. A community survey was considered, but ultimately determined to be too cost-prohibitive to pursue.

New directions and updated recommendations from recent studies and community engagement activities

Building on the priorities identified through the HIA, ReConnect Rondo has since expanded its focus to explore additional potential impacts through a series of studies focused on gentrification, neighborhood reconnection, affordable housing, and equitable development, among other topic areas. Key findings and recommendations from these studies are summarized below.

- In order to mitigate future gentrification and displacement in Rondo, as highlighted in the place-based study of gentrification and housing resiliency, ReConnect Rondo and their partners should **center community voice and concerns, address broader needs through "community investment," and increase community ownership** (Dolde, 2018).
- As identified in a feasibility study of potential land bridge concepts, the Rondo community's goals for the development of the land bridge are for neighborhood reconnection, affordable housing, equitable development, public health, green space, and community leadership (Kaskaskia Engineering Group, LLC & RKG, 2020). Recommendations from the study conclude that the land bridge should be developed using a **phased approach that incorporates public engagement; developing and adopting a community preferred concept/master plan; and integrating findings and recommendations from the Rondo land bridge HIA, sustainability study, healthy community initiative steps, and the place-based gentrification study**.
- In order to promote equity generation, prevent displacement, and increase homeownership within the Rondo community, the Yorth Group, author of the Past Prosperity study recommends that ReConnect Rondo and their stakeholders **prioritize the creation of local jobs, career pathways, and local businesses through a circular economy hub, apply Regenerative Urbanism principles to restore community well-being, and leverage opportunities for circular economic financing** (Sævarsson, 2020).

Upon reflection of the Rondo land bridge HIA, HIA is an informative tool that is most effective when the scope and specifications of a project are set, the scope is narrow, and a decision-point is clear. Since the HIA, additional studies conducted by ReConnect Rondo and its partners have pointed to the desire of Rondo community members for decision-makers to consider many of the elements that are key to the revitalization of the Rondo neighborhood. Moving forward in the Rondo land bridge planning process, assessments and processes for community engagement that consider the breadth and depth of potential community impacts, many of which affect health and well-being, will be critical. MnDOT planning processes in the Rondo neighborhood, as well as those of other key stakeholders, should involve community collaboration and be in alignment with community-driven needs and priorities. Planning a successful project will necessitate ReConnect Rondo working in close partnership with multiple government agencies and require these agencies to approach their work differently in order to hear and respond to community concerns. Please see the full report at reconnectrondo.com for more detailed information about the Rondo land bridge HIA and other studies conducted by ReConnect Rondo.

Rondo Land Bridge:
An opportunity to improve community health

Photo: Interior of the Credjafawn Co-op Store, 678 Rondo Avenue, St. Paul, ca. 1950. Courtesy of the Minnesota Historical Society

In the 1960s, the construction of Interstate I-94 tore through Rondo, a thriving African American community in Saint Paul, displacing hundreds of residents, closing local businesses, and forever changing the neighborhood and disrupting the closely-knit community. The freeway lanes created a cemented chasm, dividing what remained of the physical neighborhood and serving as a stark reminder of the breach of trust that occurred as government entities pushed I-94 construction forward without regard to the concerns of the community or willingness to consider alternative routes. Today, as the Minnesota Department of Transportation considers potential improvements along the I-94 corridor, there is hope among some community members that future transportation projects can catalyze changes to reconnect the neighborhood and ensure the residents benefit from new investment into the Rondo neighborhood.

ReConnect Rondo was established in 2016 to lead a restorative movement with a revitalized African American cultural enterprise district connected by a community land bridge. They aim to be a national model for equitable development success, known for leading a restorative movement to end racial disparities in Minnesota. In 2017, ReConnect Rondo, in partnership with Saint Paul – Ramsey County Public Health, conducted a Health Impact Assessment (HIA). The HIA process was used to engage residents in efforts to consider the potential impacts of a land bridge on community health and well-being and bring new information to decisions that will be made by the Minnesota Department of Transportation about whether a land bridge in the Rondo neighborhood will be a component of improvements made along the Interstate 94 (I-94) corridor.

The scope of any HIA is determined by understanding 1) what topics are most important to the community, 2) what is likely to influence future decision-making, and 3) what can be accomplished with available time and resources. Extensive, valuable work was undertaken in the HIA process. However, while the land bridge HIA describes the potential impacts of a land bridge on some aspects of community health and well-being, it provides only a partial picture. This report, which describes the HIA process and highlights key findings and recommendations from the study, both concludes that phase of work and describes how it can be part of ReConnect Rondo's transition to focus on new priorities moving forward. ReConnect Rondo has been and will continue to consider ways that the land bridge can be a tool to support the health and well-being of African American residents and the broader Rondo community.

Background

About the Rondo community

In the first half of the 20th century, the Rondo neighborhood in Saint Paul, Minnesota, was the heart of a close-knit African American community and a thriving cultural and economic center, including a diverse and prosperous business sector. Rondo Avenue, the community's namesake, was the main thoroughfare of the neighborhood, which extended for one-and-a-quarter square miles - roughly in between University Avenue to the north, Marshall or Selby Avenue to the south, Rice Street to the east, and Lexington Avenue to the west (Alam, 2017; Gerlich, 2016). By the 1930s, half of all African American residents in Saint Paul lived in Rondo (Alam, 2017).

Supported by local businesses and the railroad industry, many of Rondo's African American residents were middle- or upper-class, and nearby integrated schools provided widespread access to high quality education. There were a number of well-established African American community centers and social clubs, including the Hallie Q. Brown Center; the Credjafawn Social Club, food cooperative, and credit union; and the Sterling Club professional networking association, as well as several established newspapers (Alam, 2017; Anderson, 2016; Huber, 2011).

Rondo residents defined their community by tight-knit social connections, public trust, and safety (Lindeke, 2019; Williams, 2016). Everyone knew one another, and children experienced a "network of care" from adults in the community, outside of their own families, who would look out for and protect them (Lindeke, 2019; Williams, 2016).

> *We used to skate all night long almost. And walk in the neighborhood, didn't care if it was night or not 'cause nobody ever bothered you. They all protected you […] they knew who you were (Williams, 2016).*

Destruction and displacement from I-94

In the 1940s, the Minnesota Highway Department (MHD) began planning for the construction of a highway system connecting downtown Saint Paul and Minneapolis. The primary proposed route, called the "St. Anthony Route," was planned to cut straight through the Rondo neighborhood. The Saint Paul city engineer, George Harrold, opposed the St. Anthony Route because it would lead to the displacement of families and local businesses in an entire neighborhood. He proposed an alternative, called the Northern Route, which would instead run adjacent to existing railway lines one mile north of St. Anthony Avenue.

MHD never seriously considered this alternative because they thought it was too far out of the way and, therefore, too inconvenient for residents in Saint Paul neighborhoods south of University Avenue—theoretically leading to less traffic on the proposed highway, and higher road costs on alternative routes. The highway plan, with the St. Anthony Route, was approved in 1947. African American leaders in the Rondo neighborhood did not become aware of the already approved plan until six years later, in 1953.

Despite community resistance, construction on the interstate began in 1956 (Beer, 2019). I-94 construction destroyed over 700 Rondo families' homes and destroyed many Black-owned businesses, many of which never reopened (Beer, 2019; Cavanaugh, 2006; Sævarsson, 2020). Among the families who lost their homes, 72% were African American, which amounted to one out of eight African Americans in Saint Paul losing their home because of the construction of I-94 (Cavanaugh, 2006). Families not only experienced the immediate loss caused by the destruction of

their homes, local businesses, and community assets, but also received unfair compensation for these losses. This was coupled with difficulty relocating to other neighborhoods because of redlining and racial covenants that restricted African Americans from purchasing homes in some areas of Saint Paul, allowing families fewer opportunities for wealth generation from home or business ownership. A recent study from the Yorth Group, commissioned by ReConnect Rondo, estimated that the construction of I-94, and the resulting loss of home equity, contributed to $157 million in potential intergenerational wealth lost among Rondo residents (Sævarsson, 2020).

Reconnecting Rondo and fostering community healing

Despite the physical chasm created by the interstate, and many families being forcibly physically displaced from their homes, the Rondo community has maintained a strong collective memory and cultural identity. Long-standing organizations, like the Hallie Q. Brown Community Center, continue to be strong community assets, and new organizations, such as Rondo Avenue, Inc., work to preserve the neighborhood's past and look to its future. In 1983, the annual Rondo Days Festival was established, which "reunites a dispersed people" and works to "transmit the history and rich cultural traditions of Rondo and connect them with modern values for an ever-evolving community" (Rondo Avenue, Inc., 2019). In 2018, the Rondo Commemorative Plaza opened, which includes green space, areas for gathering, art, and panels celebrating both the community's African American history and recognizing the cultural communities that have more recently become part of the Rondo neighborhood, often as immigrants or refugees.

Efforts to revitalize the Rondo neighborhood or investment in nearby community development projects, such as Allianz Field and the Green Line segment of the light-rail system, often begin with a promise of benefiting community members and local businesses. However, these projects have the potential to cause gentrification and displacement if not planned and implemented with community input and agencies' willingness to prioritize community interests.

The idea of a cap or land bridge first surfaced as a community response to initial development plans for the light rail along the Central Corridor in 2009. Specifically, community members were outraged that the Green Line plans did not include any light rail stops along the section running through Rondo (Yuen, 2014). ReConnect Rondo was established in 2016 to engage community members and work in collaboration with the Minnesota Department of Transportation (MnDOT), the City of Saint Paul, the Metropolitan Council, and Ramsey County to further explore a land bridge crossing I-94 and to identify potential health impacts on the community. ReConnect Rondo believes that the land bridge has the potential to not only physically reconnect the Rondo neighborhood, but also to support healing and reinvestment that benefits African American residents and the broader Rondo community.

Rethinking I-94

In 2016, the Minnesota Department of Transportation (MnDOT) began *Rethinking I-94* to engage communities in work to identify and address needs along the I-94 corridor between Broadway Avenue in Minneapolis and Highway 61 in Saint Paul, which includes the Rondo neighborhood. The work is intended to make transportation easier along the corridor and establish a sense of place for communities along the corridor, improve safety for all types of mobility and transportation options, and emphasize reconnecting neighborhoods and engaging communities in transportation decision-making. The agency's approach also acknowledges the harm caused through the initial construction of I-94. On the MnDOT website, the project overview states that "MnDOT formed *Rethinking I-94* as part of the promise to the Rondo community – and all the communities in the I-94 corridor – to do better" (MnDOT, n.d.).

Rethinking I-94 has three main goals identified by the agency:

- Make it easier to travel to, along, and across the I-94 corridor and establish a sense of place for the communities that live, work, and play there.
- Enhance safety and mobility for people walking, biking, driving, and using transit.
- Develop a community-based approach focused on reconnecting neighborhoods, revitalizing communities, and ensuring residents have a meaningful voice in transportation decisions that affect their lives.

\- *Minnesota Department of Transportation, 2018*

Throughout the planning process, MnDOT has engaged with ReConnect Rondo around their concept of a land bridge. The land bridge would not be constructed using MnDOT funds, but has the potential to contribute to the goals of *Rethinking I-94*. A land bridge (also called a freeway lid or highway cap) is an alternative to a traditional bridge deck that can be used to create new green, residential, or commercial space; connect neighborhoods; and improve accessibility for pedestrians and bicyclists. For individuals using the space, the land bridge is a continuation of the city landscape, rather than an obvious crossing over a busy highway. ReConnect Rondo envisioned a .5-mile land bridge that would cross I-94 between Chatsworth and Grotto streets. A feasibility analysis for the land bridge was completed in 2020. Master planning and preliminary design for the land will begin in 2021. With this said, the size and scale of the community land bridge, and what inclusions will be atop of the land bridge are not decided, nor has a determination been made as to the balance of green space, retail, education, business incubation spaces, and residential properties and units. This and other decision-making processes should incorporate extensive community engagement and input in partnership with ReConnect Rondo.

Status of MnDOT planning

In 2018, MnDOT completed Phase 1 of planning their development around I-94. This phase included community engagement activities to understand what communities in the I-94 corridor want from transportation systems. To this end, MnDOT collected 2,200 baseline surveys, held listening sessions with 75 participants, and conducted over 800 interviews, among other engagement activities. This information was used to create guidelines for MnDOT on how to interact with communities along the corridor and how to plan and design projects. The first set of guidelines includes Guiding Commitments related to vision, co-power, authentic respect, transparency, and inclusivity established through a formal community engagement process. The second set includes statements that form a Livability Framework; health & environment, economics, sense of place, safety, connections, equity, and trust. For more information, see MnDOT's Rethinking I-94 Phase 1 Report.

Phase 2 will focus on the creation of an environmental document to develop and evaluate transportation improvement actions for I-94. The process schedule was delayed due to the COVID-19 pandemic. The public engagement efforts will resume in February 2021.

A land bridge as a potential tool for revitalization and restoration

The first land bridge in the United States was built in Seattle in 1976 and became Freeway Park, the city's largest public space in the downtown area and a new connection between downtown and the city's convention center and nearby neighborhoods. Since that point, land bridges have been constructed in multiple cities, including Gichi-ode' Akiing (Lake Place Park) in Duluth, Klyde Warran Park in Dallas, and Millennium Park in Chicago, built over a railyard.

Many of these projects are located in downtown areas, in high-value real estate markets, and often focus on creating green space and boosting economic development. However, Saint Paul is on a short but growing list of cities considering land bridges as a way to invest in communities that had been unjustly harmed by past transportation construction projects. Ensuring these types of projects are designed and constructed in ways that benefit the local community, and avoid unintended negative impacts such as displacement due to rising property values, requires proactive planning and collaborative decision-making in partnership with community members and agency stakeholders.

A Community to Watch: Denver

Denver is midway through construction of a highway cap that will create new park space next to the Elyria-Swansea neighborhood, a predominantly Latino community that had previously been disconnected from the larger city by I-70. While residents welcomed the additional green space and the potential benefits to students attending the neighborhood elementary school, there are also concerns about potential increases in property values and rent displacing residents, as well as pollution during and after construction. Understanding this community's experience may provide insight into how to avoid unintended negative consequences and implement effective policies to mitigate concerns of Rondo residents.

ReConnect Rondo sees an opportunity for a land bridge to be used as a tool for neighborhood revitalization and community restoration. However, doing so requires ongoing community engagement and true partnership with the state and local government agencies with decision-making authority so that practices and policies are put in place to not only avoid displacement, gentrification, and other inequitable outcomes, but to ensure the community benefits through the project and investment of resources. ReConnect Rondo envisioned the Health Impact Assessment (HIA) as an initial step to identify the considerations that must be incorporated into the I-94 redesign planning process so that past mistakes are not repeated and the project becomes an opportunity for healing and revitalization.

Health Impact Assessment (HIA) summary and key findings

Health Impact Assessment (HIA) is a tool for ensuring the potential health impacts of a proposed policy or decision on communities are identified and addressed. This approach can help decision-makers adopt a broader perspective and consider a more holistic set of factors that impact community members, rather than focusing exclusively on economic or environmental impacts. While HIA is a relatively new approach, it has been used in a number of communities in Minnesota, across the United States, and globally to help ensure community health and well-being is considered in decision-making processes.

What is HIA?

Health Impact Assessment (HIA) is a process to help communities and decision-makers identify the potential health effects of a plan, project, or policy and how it may disproportionately affect different groups before it is implemented. The process helps identify potential positive and negative health impacts and considerations to the decision-making process and leads to practical recommendations to increase positive health effects and minimize preventable health risks and negative health outcomes.

- Adapted from Health Impact Project
https://www.pewtrusts.org/en/projects/health-impact-project/health-impact-assessment

HIAs often focus on social determinants of health, defined as the conditions in the environments in which people live, learn, work, and play that affect health and overall quality of life (Healthy People 2020, n.d.). Social determinants include neighborhood conditions (e.g., access to resources and high quality schools, community safety, green space, air and water quality), economic circumstances (e.g., employment rates, homeownership), and other social factors (e.g., experiencing racism or other forms of oppression, community cohesion). Unjust policies and decision-making can lead to unequal distribution of resources and allocation of funding across neighborhoods, often adding to advantages already present in affluent communities and neighborhoods where white residents predominantly live. As a result, social determinants of health are considered drivers of health inequities, the pervasive but avoidable differences in health outcomes between populations.

Health equity is achieved when all people have the opportunity to attain their best health and no one is unjustly prevented from having this optimal health due to unfair and avoidable social and environmental conditions.

Because HIAs are often conducted when there is potential for a community to be disproportionately impacted by a pending decision, equity is a focus for many HIAs. The HIA process can be a tool for amplifying community voice, introducing relevant data into the decision-making process, and offering solutions to avoid overlooked or unintended negative health impacts.

ReConnect Rondo HIA stakeholders

To conduct the HIA, ReConnect Rondo staff convened an **HIA Planning Team** that included Saint Paul – Ramsey County Public Health and Minnesota Department of Health (MDH) staff with experience in the approach to provide ongoing technical assistance. This group was responsible for planning the process used to ensure the HIA included all key steps (described below). Within ReConnect Rondo, the process was led by staff with community organizing expertise and supported by three graduate students from the University of Minnesota Humphrey School of Public Affairs.

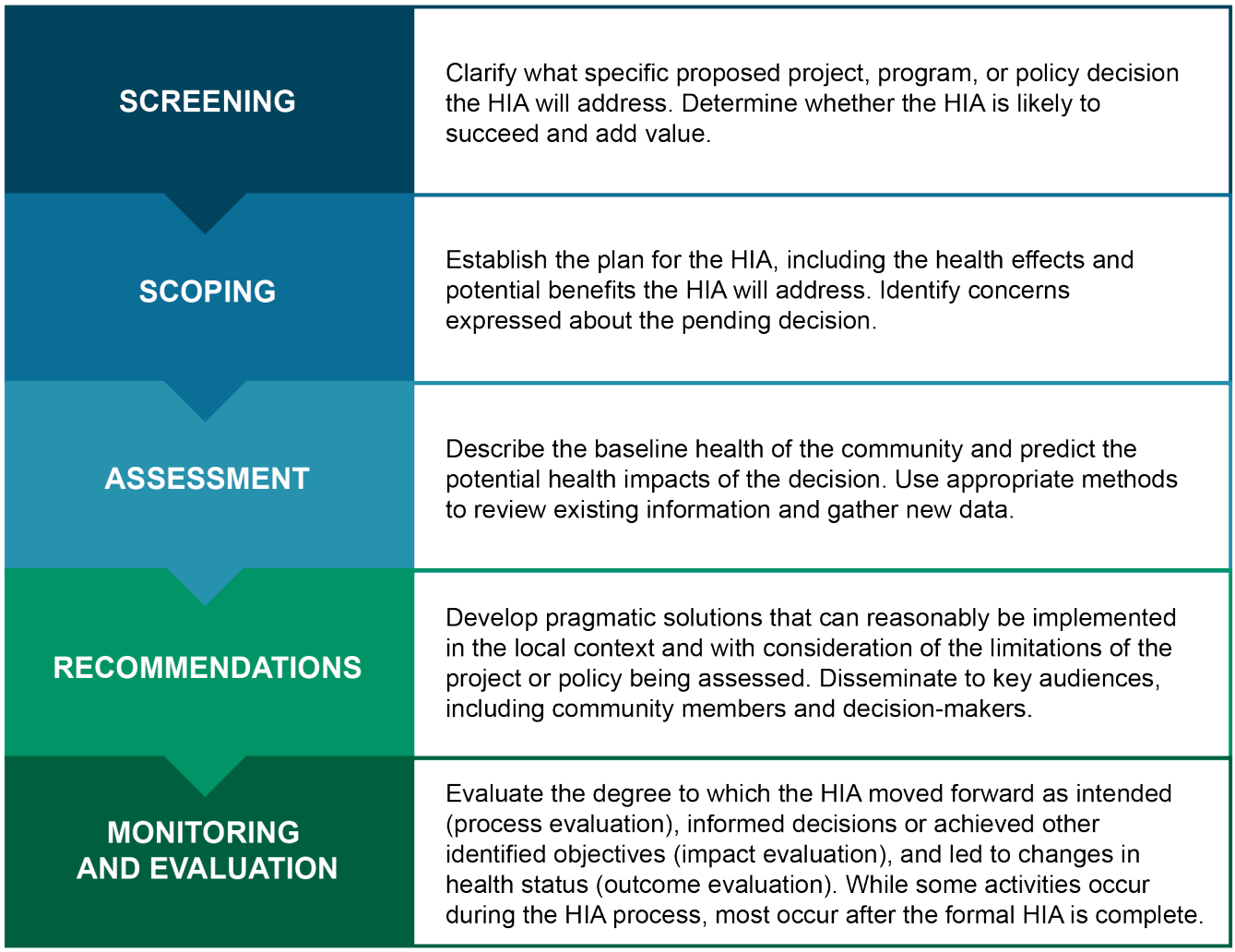
The **HIA Community Advisory Committee**, comprised of Rondo community residents and representatives of community-based organizations, was the main decision-making body, using information gathered through the HIA process to establish the scope of work, consider ways in which health and well-being could be impacted by a land bridge, and develop recommendations.

ReConnect Rondo also convened an **HIA Technical Advisory Committee**, which included HIA Planning Team members as well as local city council members and representatives from MnDOT, Trust for Public Land, the Minnesota Pollution Control Agency (MPCA), and Wilder Research who could advise on data, provide technical assistance, and offer suggestions for data collection methods being considered by ReConnect Rondo staff and the HIA Planning Team.

HIA process overview

While HIAs can vary widely in terms of scope and the degree to which community members are engaged in or leading the process, all use a common set of five key steps: screening, scoping, assessment, recommendations, and monitoring and evaluation (Figure 1). The ReConnect Rondo HIA is an example of an independent HIA; in contrast, other HIAs have been conducted as part of a broader environmental impact assessment or feasibility study.

1. Health Impact Assessment (HIA) steps



Note. - Adapted from The PEW Charitable Trusts, 2014

ReConnect Rondo HIA key findings and lessons learned

Since the completion of the HIA in 2017, there have been transitions among ReConnect Rondo staff and board members who were involved most directly with the process, including the individuals who led the HIA and related community engagement efforts. ReConnect Rondo has used the HIA findings to understand some of the community's priorities regarding the development of a land bridge and its potential contribution to the revitalization of Rondo. The review of key findings in this summary draws heavily from a capstone paper completed by the graduate students who were involved with the project. Additionally, this report draws upon the experience of a Wilder Research staff person who participated as a member of the HIA Technical Advisory Committee and continued to engage with the HIA Planning Team after the HIA was completed to determine the best ways to document this phase of work. To honor the work done by the HIA team and HIA Community Advisory Committee, this section elevates work completed and recommendations developed through that process, while also offering lessons learned, both as a participant and observer of the process. New data compiled by Wilder Research are also included.

Screening

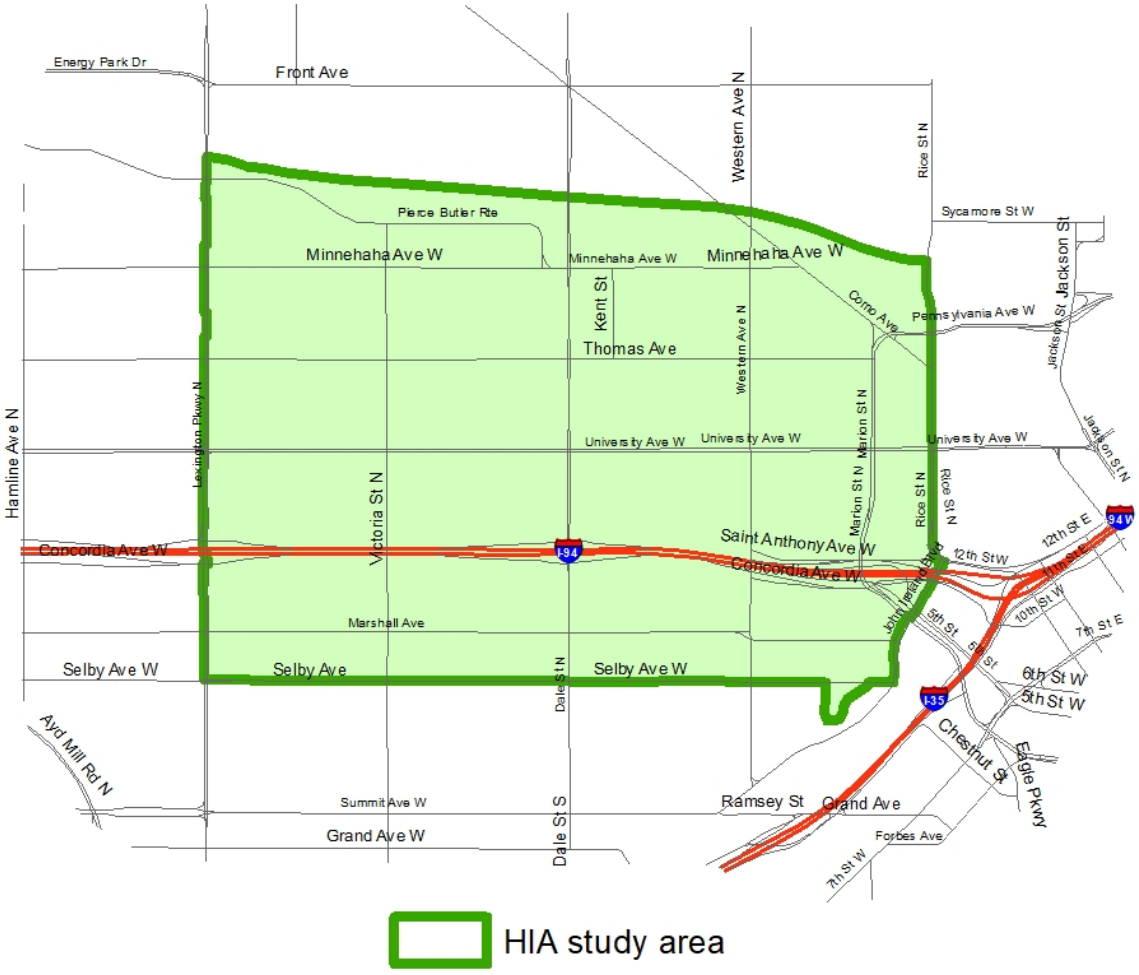
The HIA process helped inform MnDOT's *Rethinking I-94* planning efforts by working to determine whether there was community support for a land bridge and to inform future decision-making by exploring the potential health impacts of a land bridge. The screening step was conducted by ReConnect Rondo and Saint Paul – Ramsey County Public Health. The HIA was seen as an opportunity to amplify community voice and introduce the importance of considering the potential health impacts that both construction and the completed land bridge may have on community health and well-being. However, the fact that many of the land bridge design elements were unknown and open for consideration at this early conceptualization phase caused challenges in subsequent HIA steps. The HIA was intended to be completed in time to meet MnDOT deadlines for I-94 project concepts to be considered in the agency's first phase of planning. In practice, while the work completed through the HIA will still be used by MnDOT, the timelines established by MnDOT did not align with the funding period and time necessary for meaningful community engagement.

Lessons learned: HIA is a promising tool to bring information about potential health impacts into MnDOT planning and decision-making. However, introducing HIA early in MnDOT's planning process also presented challenges. For example, uncertainty about the land bridge size and design led to challenges clearly identifying potential health concerns. In addition, knowing that multiple studies are needed to inform decision-making and design, it was unclear how to best focus this HIA to inform future MnDOT planning and complement the work likely to be undertaken in future feasibility, technical, and environmental studies.

Scoping

The scoping step occurred in a series of HIA Community Advisory Committee meetings facilitated by ReConnect Rondo. During these meetings, the HIA committee members identified how they would define the community most likely to be affected by the project, and the health effects that were most important to focus on throughout the HIA. With input from the HIA committee, the decision was made to focus the HIA on a relatively large geographic area that included the area between Lexington Avenue and extending east along I-94 to Rice Street, bordered by Selby Avenue to the south and Pierce Butler Route to the north (Figure 2).

2. HIA geographic area of focus



Through a series of discussions, HIA committee members reflected on what a healthy Rondo community looked like to them and identified a number of factors that influence health and that could be the focus of the HIA. The factors were wide-ranging and included the following themes:

- Affordable housing
- Historical trauma
- Local economy
- Access to opportunities for physical activity and green space
- Food access
- Mental health
- Pollution
- Relationships and community connection
- Youth well-being
- Support for aging in place
- Gentrification

Although each of these topics are important to the health and vitality of the Rondo neighborhood, the scoping phase of the HIA requires participants to prioritize topic areas. Through a combination of discussion and voting, the HIA committee selected the following three topics as primary focus areas for this HIA: green space, opportunities for physical activity, and local economy.

In HIAs, causal pathways are often used to consider the potential health effects of a decision to help inform decisions about scope. Pathways typically begin by identifying an effect closely related to the proposed project or decision, and uses community input, literature review, and sometimes consultation from experts in a topic area to identify the relevant social determinants and potential short- and long-term health effects. For each focus area of the ReConnect Rondo HIA, the HIA committee members created causal pathways to visualize ways in which the land bridge could potentially impact short- and long-term health outcomes and measures of well-being, both positively and negatively. These pathways (see Appendix) informed data gathered during the assessment step of the HIA process. While each pathway diagram included unique elements, all three ultimately identified ways in which the land bridge, both while under construction and after completed, could impact mental health, asthma, and chronic disease among Rondo community members.

Across all pathways, changes in pollution were identified as the primary factor that may contribute to changes in asthma rates. A broader set of factors were identified as potentially influencing rates of chronic disease, including: pollution, which can increase risk of cancer, and opportunities for physical activity and access to healthy food and subsequent changes in obesity, which impacts the risk of diabetes, heart disease, and some types of cancer. Two of the three pathways (green space and local economy) both consider how the land bridge could impact mental health and well-being as a result of changes in property value, household wealth, and, potentially, neighborhood gentrification. The green space pathway also emphasized the land bridge potentially impacting community cohesion and ultimately influencing mental health and well-being.

Lessons learned: To work within the parameters of the HIA budget and timeline, it was critical for the HIA to focus on a small number of priorities that would likely impact Rondo residents if a land bridge was constructed. However, as new stakeholders were engaged with the HIA process, there were questions about the degree to which the scoping decisions made by the HIA committee reflected the priorities of the entire Rondo community. Clear documentation of the decision-making process in the scoping stage of HIA is helpful for maintaining transparency and building buy-in throughout the process.

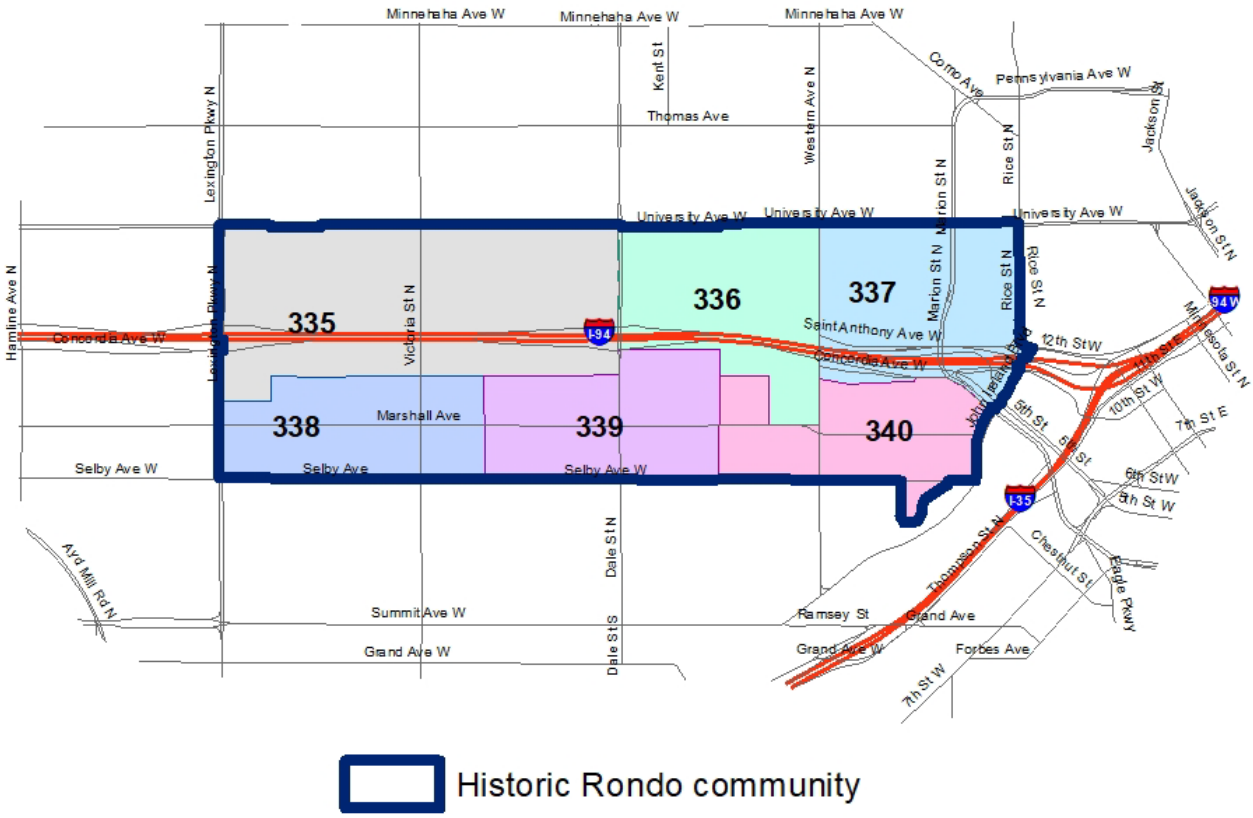
Assessment

In HIA, potential changes in health outcomes are assessed by first establishing the base conditions, including the demographic characteristics of community residents, to then consider how key outcomes of interest may be influenced by a proposed decision. Estimating potential health impacts of a decision is challenging, as changes in health outcomes may take place over years or decades and can be influenced by multiple factors. As a result, many HIAs – including the ReConnect Rondo HIA – use descriptive information to report the likely direction and magnitude of changes in health outcomes, rather than clear numerical data.

Community demographic and descriptive information

The data gathered during the HIA process focused on a geographic area that extended north to Pierce Butler Route. In this report, this information is updated to include the most recent demographic data available, and with a focus on a somewhat smaller geographic area (extending north to University Avenue; Figure 3). Specifically, demographic data are reported for six specific census tracts in Saint Paul, which, together, form the approximate boundaries of the historic Rondo neighborhood. Data are reported for each census tract individually, and not in aggregate (i.e., for Rondo as a whole) because of substantial differences in gentrification in the census tracts which fall largely north (335, 336, and 337) and south (338, 339, and 340) of I-94.

3. Approximate historic Rondo neighborhood boundaries



➔ ***The Rondo neighborhood is home to an increasingly culturally diverse population (Figure 4; Figure 5).***

4. Race and ethnicity of Rondo residents

	Census tracts North of I-94			Census tracts South of I-94		
	335	**336**	**337**	**338**	**339**	**340**
Race and ethnicity (2013-17)						
White	17%	[a]	24%	41%	45%	83%
Of Color	83%	98%	77%	59%	55%	[a]
Black or African American	48%	73%	53%	40%	41%	11%
American Indian and Alaska Native	[a]	[a]	[a]	[a]	[a]	[a]
Asian or Pacific Islander	18%	21%	14%	[a]	[a]	[a]
Other	[a]	[a]	[a]	[a]	[a]	[a]
Two or more races	[a]	[a]	[a]	5%	[a]	[a]
Hispanic or Latino	8%	[a]	[a]	[a]	[a]	[a]

Source. Minnesota Compass. (n.d.). *Build your own profile – by census tract.* https://www.mncompass.org/profiles/custom

[a] Indicates that the data for this demographic characteristic have been suppressed. Data are suppressed when there are fewer than 10 people or units in a category, the percentage estimate is less than 1%, or the error margins were greater than 70% of the estimate of a numeric value.

5. Nativity of and languages spoken among Rondo residents

	Census tracts North of I-94			Census tracts South of I-94		
	335	**336**	**337**	**338**	**339**	**340**
Foreign-born residents (2013-17)	22%	45%	47%	[a]	18%	[a]
Language spoken (2013-17)						
English only	64%	35%	48%	87%	67%	94%
Language other than English	36%	65%	52%	[a]	31%	[a]
Speaks English less than "very well"	18%	27%	38%	[a]	11%	[a]

Source. Minnesota Compass. (n.d.). *Build your own profile – by census tract.* https://www.mncompass.org/profiles/custom

[a] Indicates that the data for this demographic characteristic have been suppressed. Data are suppressed when there are fewer than 10 people or units in a category, the percentage estimate is less than 1%, or the error margins were greater than 70% of the estimate of a numeric value.

➔ *There are differences in socioeconomic status across the Rondo neighborhood (Figure 6).*

6. Household income and poverty among Rondo residents

	Census tracts North of I-94			Census tracts South of I-94		
	335	**336**	**337**	**338**	**339**	**340**
Household income (2013-17; 2017 dollars)						
Less than $35,000	37%	74%	87%	36%	36%	30%
$35,000-$49,999	11%	16%	[a]	12%	11%	19%
$50,000-$74,999	21%	[a]	[a]	14%	31%	20%
$75,000-$99,999	19%	[a]	[a]	13%	9%	13%
$100,000 or more	13%	[a]	[a]	25%	13%	18%
Median household income	$53,415	$17,156	$16,089	$53,068	$54,125	$50,926
Poverty (2013-17)						
With income below poverty	34%	49%	43%	26%	29%	13%
With income 100-149% of poverty	[a]	24%	34%	12%	[a]	[a]
With income 150-199% of poverty	12%	[a]	12%	9%	[a]	9%
With income 200% of poverty or higher	49%	[a]	12%	53%	54%	63%

Source. Minnesota Compass. (n.d.). *Build your own profile – by census tract.* https://www.mncompass.org/profiles/custom

[a] Indicates that the data for this demographic characteristic have been suppressed. Data are suppressed when there are fewer than 10 people or units in a category, the percentage estimate is less than 1%, or the error margins were greater than 70% of the estimate of a numeric value.

➔ *Many Rondo neighborhood households are housing cost-burdened (Figure 7).*

7. Housing availability and affordability in Rondo

	Census tracts North of I-94			Census tracts South of I-94		
	335	**336**	**337**	**338**	**339**	**340**
Total housing units (2013-17)	1,246	644	699	667	625	907
Vacant housing units	[a]	[a]	[a]	[a]	7%	[a]
Occupied housing units	92%	98%	95%	93%	93%	93%
Owner-occupied (2013-17)	47%	11%	7%	57%	41%	25%
Renter-occupied (2013-17)	53%	89%	93%	43%	59%	75%

Source. Minnesota Compass. (n.d.). *Build your own profile – by census tract.* https://www.mncompass.org/profiles/custom

[a] Indicates that the data for this demographic characteristic have been suppressed. Data are suppressed when there are fewer than 10 people or units in a category, the percentage estimate is less than 1%, or the error margins were greater than 70% of the estimate of a numeric value.

7. Housing availability and affordability in Rondo (continued)

	Census tracts North of I-94			Census tracts South of I-94		
	335	336	337	338	339	340
Housing cost-burdened households (2013-17)[b]						
Overall	38%	50%	56%	38%	44%	35%
Owner households	26%	[a]	[a]	36%	46%	32%
Renter household	48%	51%	57%	41%	42%	37%

Source. Minnesota Compass. (n.d.) *Build your own profile – by census tract.* https://www.mncompass.org/profiles/custom

[a] Indicates that the data for this demographic characteristic have been suppressed. Data are suppressed when there are fewer than 10 people or units in a category, the percentage estimate is less than 1%, or the error margins were greater than 70% of the estimate of a numeric value.

[b] Households are considered housing cost-burdened if they pay 30% or more of their income for housing.

Estimated health effects presented in the HIA

The HIA included a wide range of data points, relevant to each focus area and pathway. The capstone report completed through the HIA included a rationale for the data compiled for each focus area and how these measures contribute to overall health outcomes. In the assessment phase of many HIAs, subjective ratings are used to describe likely health impacts of a decision. In this report, we present the ratings established through the HIA process with ReConnect Rondo and the HIA Community Advisory Committee, and documented in a final capstone report (see Appendix).

Green space. The HIA included multiple data sources to estimate how increasing green space with the addition of the land bridge would impact health outcomes. The assessment considered: available park space; changes in water quality that may occur during land bridge construction; air pollution from traffic moving under the land bridge; impacts of green space on mental health, stress, and well-being; impacts of green space on air and water quality; and rates of crime.

Overall, the report completed by Hoveland, Hoffman, and Jerome (2017) (see Appendix) concluded that increased green space was likely to improve mental health and well-being for individuals closest to the land bridge or who regularly use the space. They also concluded there was low likelihood for changes in asthma or cancer among Rondo residents and that potential for changes in injury were uncertain. The authors drew these conclusions based on a review of relevant studies.

Opportunities for physical activity. The completed report described that the land bridge could lead to more opportunities for physical activity by adding additional green space, parks, and other community space to the neighborhood, as well as creating more opportunities for active transportation (e.g., walking, bicycling). The assessment noted that the land bridge could create more opportunities for residents to walk to various locations (e.g., school, grocery store, child care, places of employment, parks) or access public transit. The authors concluded that by increasing opportunities for physical activity and reducing reliance on driving to access goods and services, obesity rates could decrease.

They further concluded there is a low likelihood of residents experiencing positive change in asthma and cancer rates and rated changes in mental health as "possible" but requiring additional data.

Local economy. The capstone report authors described multiple ways that the land bridge could impact the local economy. Increasing green space could lead to an increase in property values and stimulate new business and real estate development. Both the construction phase and addition of new businesses could impact rates of employment or wages. The report also highlighted potential concerns, including potential misalignment between new employment opportunities and the job skills of local residents, and the potential of increasing property values leading to gentrification and displacement of current Rondo residents due to higher rent or property taxes.

The assessment concluded that, depending on the types of policies enacted, a land bridge could have positive or negative impacts on the economic stability of current Rondo residents and related mental health and chronic disease outcomes. Specifically, the HIA referred to insights from rezoning along the Central Corridor for the Green Line light rail project. Based on these insights and studies reviewed, the authors assert that the land bridge will most likely be a valuable asset that could draw more businesses and developments to the area. Mixed use, higher density developments, especially along commercial corridors in the area could improve livability for current residents, as mixed-use zoning could allow for improved walkability, space for locally owned businesses, more affordable housing units, and more community spaces. When paired with inclusionary zoning, mixed-use developments can provide even more affordable housing and business options.

Gaps and other data limitations

As with any HIA, some descriptive information, as well as health and well-being measures of interest to the HIA community advisory committee were not readily available. For some types of data relevant to the HIA (e.g., health behaviors, measures of mental health) estimates had high margins of error at the neighborhood level, while other types of information (e.g., neighborhood cohesion) can only be gathered through new data collection. A community survey was considered, but ultimately determined to be too cost-prohibitive to pursue.

Lessons learned: Presenting census tract-level data, when available, can show how demographic and descriptive information varies at a local level within the broader Rondo neighborhood. While it was appropriate and common in the HIA to focus the analysis on long-term health outcome measures (e.g., obesity, cancer, mental health), estimating changes in social determinants (e.g., homeownership, income, employment, changes in property value) may have been of greater utility to ReConnect Rondo and local stakeholders.

Recommendations

The following recommendations were developed through the HIA to mitigate potential negative health impacts and optimize community well-being. These recommendations will be shared with MnDOT, along with recommendations highlighted in other studies referenced later on in this report.

Green space recommendations

- Design the green space on the land bridge with the community, specifically youth and elders, to ensure future utilization. It should include:
  - A portion dedicated to urban agriculture
  - Public art commemorating the history of the Rondo neighborhood
  - Key components of Crime Prevention through Environmental Design (CPTED) theory
  - A diverse range of plant and tree species to increase canopy coverage
- Create a local nonprofit focused on programming on the land bridge, particularly youth programming
- Increase street cleaning on streets with an increase in boulevard trees to avoid clogged sewers and flooding
- Establish permit-parking only areas around the new green space to limit parking problems and encourage the use of public transit
- Work in partnership with the Capitol Region Watershed to increase storm water capacity in the neighborhood
- Explore new technologies to clean emissions and reduce noise in the tunnel created by the land bridge

Opportunities for physical activity recommendations

- As part of the land bridge design, include programming and amenities designed to increase neighborhood physical activity (e.g., sports fields, playground equipment)
- Increase pedestrian connections across the freeway
- Integrate the Rondo neighborhood into the Saint Paul Bicycle Plan
- Zone Rondo as a dense, mixed-use neighborhood where residents can easily walk or bike to reach goods and services

Local economy recommendations

- Establish a community benefits agreement (CBA) between developers, community members, Minnesota State Government, and the City of Saint Paul focused on inclusiveness and accountability throughout the negotiation and development process
- Utilize inclusionary zoning and neighborhood planning tools to increase the amount and diversity of affordable housing types in the neighborhood
- Expand support for local businesses and entrepreneurs through City funding streams and nonprofit business support organizations
- Reserve legitimate decision-making participation opportunities for community members

Lessons learned: The HIA was designed to inform decisions by MnDOT about whether to include consideration of a land bridge in its ongoing *Rethinking I-94* efforts. However, a potential project of this size requires the involvement of multiple state and county government entities. The recommendations developed through the HIA will need to be shared with multiple partners at different points in time to help inform relevant decision-making processes.

Evaluation and monitoring

The final step of any HIA is evaluation and monitoring. This report, which highlights lessons learned from the HIA process, is one way of documenting the process and lessons learned along the way. The HIA's impact can be evaluated by monitoring the degree to which recommendations developed through the process are adopted by MnDOT and identifying measures that will indicate progress towards desired long-term outcomes or flag concerns that need to be addressed in order to ensure the project is a benefit to the community.

Building on the HIA: Addressing broader community concerns

Additional considerations for decision-makers from recent studies and community engagement

The HIA provided valuable information about the potential impacts of the Rondo land bridge on green space, opportunities for physical activity, and local economy and the subsequent health of community members. However, in the years since the HIA, ReConnect Rondo has expanded their focus to explore additional potential impacts that encompass a more comprehensive understanding of community interests and concerns. This work has included, but is not limited to, the Place-Based Study of Gentrification and Housing Resiliency (Dolde, 2018), the Rondo Land Bridge Feasibility Study (Kaskaskia Engineering Group, LLC. & RKG, 2020), and the Past Prosperity study (Sævarsson, 2020). Findings and recommendations to inform decision-making around the Rondo land bridge among key stakeholders (e.g., MnDOT, Metropolitan Council, City of Saint Paul, Ramsey County, community members, ReConnect Rondo) are summarized below.

Place-based study of gentrification and housing resiliency

Through ReConnect Rondo's community engagement activities, many community members raised concerns related to gentrification and displacement that could arise as a result of development projects such as the Rondo land bridge. In response, ReConnect Rondo initiated Dolde's place-based study of gentrification and housing resiliency (2018). This study focused on two primary research questions:

1. How can a land bridge project uplift the aspirations of Rondo while ensuring that this community can remain in place to reap the benefits?
2. How can research and place-based knowledge help to promote justice for the Rondo community?

Place-based gentrification study recommendations

Based on a review of the existing literature, this study recommended a number of strategies to address and mitigate future gentrification and displacement in Rondo, including:

- **Centering community voice and concerns**, through the incorporation of a Rondo community committee in ReConnect Rondo's governing structure, the creation of a community benefits agreement, and throughout project conceptualization and policy decision-making points.
- **Addressing community needs and desires via "community investment,"** through addressing existing needs in the Rondo community beyond the land bridge (e.g., through neighborhood coalition-building and advocacy), establishing an anti-gentrification task force that advocates for local policy change (e.g., 4(d) tax breaks with rental subsidy, housing trust funds, rental assistance and education programs, rental rehabilitation programs, just cause eviction ordinance), and collaborating with other community partners and knowledge centers.
- **Increasing community ownership,** through strengthening community leadership and engagement (e.g., through the ReConnect Rondo community committee), the creation of a housing stock and residential stability inventory, and increasing land control and legal ownership through the aforementioned community benefits agreement and affordable housing advocacy (including the incorporation of affordable housing into future designs of the potential Rondo land bridge).

Rondo land bridge feasibility study

In 2019, a study was conducted to further explore the concept of a land bridge through the next step of the project development process and provide decision makers with the information necessary to make feasible and reasonable decisions (Kaskaskia Engineering Group, LLC. & RKG, 2020). Goals related to the implementation of a land bridge were identified and used to screen several development concepts. These goals build on themes identified through the HIA process detailed in the previous section. Goals identified in the feasibility study include:

1. Neighborhood Reconnection – Reconnect the neighborhood on both sides of I-94 in ways that serve as a catalyst for wider community-wide initiatives.
2. Affordable Housing – Provide mechanisms to minimize barriers and provide financial incentives to promote the production and preservation of a diverse, safe, healthy, and affordable housing stock.
3. Equitable Development – Create a framework for inclusive economic opportunity for the community.
4. Public Health/Green Space – Improve public health disparities by providing access to green space and outdoor opportunities.
5. Community Leadership – Strategize to keep this project a "community led" initiative and work closely with state, regional, and city officials to implement regulatory and policy solutions, as appropriate, to maximize community involvement and to minimize involuntary displacements and moderate gentrification.

After the initial screening of concepts for the land bridge, evaluation criteria were developed that included project goals and additional criteria to evaluate the top concepts, including considerations for engineering/traffic, network/modal connectivity, environmental/health, and economic opportunities.

Additionally, a SWOT analysis identified strengths, weaknesses, opportunities, and threats associated with the potential development of a land bridge (Figure 8).

8. SWOT analysis from Rondo land bridge feasibility study

Strengths	Weaknesses
– Established neighborhood – Existing recognized arts and cultural community (e.g., Selby Jazz Fest, Penumbra Theatre) – Rondo Community Land Trust – Ongoing work by community leaders and groups provides a foundation for required analyses – Victoria Street lacks on/off ramps, avoiding conflicts with freeway functions	– Project lacks a Master Plan – long-term planning document that provides a conceptual layout to guide future growth and development and includes analysis, recommendations, and proposals for an area's population, economy, housing, transportation, community facilities, and land use – Project lacks a comprehensive market analysis and financial analysis to examine the feasibility before a development program is finalized – Developing outside of Victoria Street runs the risk for conflicting freeway functions
Opportunities	**Threats**
– Healing a neighborhood identity – Redevelop vacant properties – Removal of/redevelop blighted properties – Create open space for passive recreation and social interaction, which the area currently lacks	– Gentrification concerns similar to other developed areas of Saint Paul – Environmental impacts – hazardous waste, threatened and endangered species (e.g., Rusty patched bumble bee) – Lack of scale of traffic changes prevents certainty on a number of impacts – Lack of private funding to pay for features not covered by public funding

Feasibility study recommendations

Recommendations for the feasibility study include:

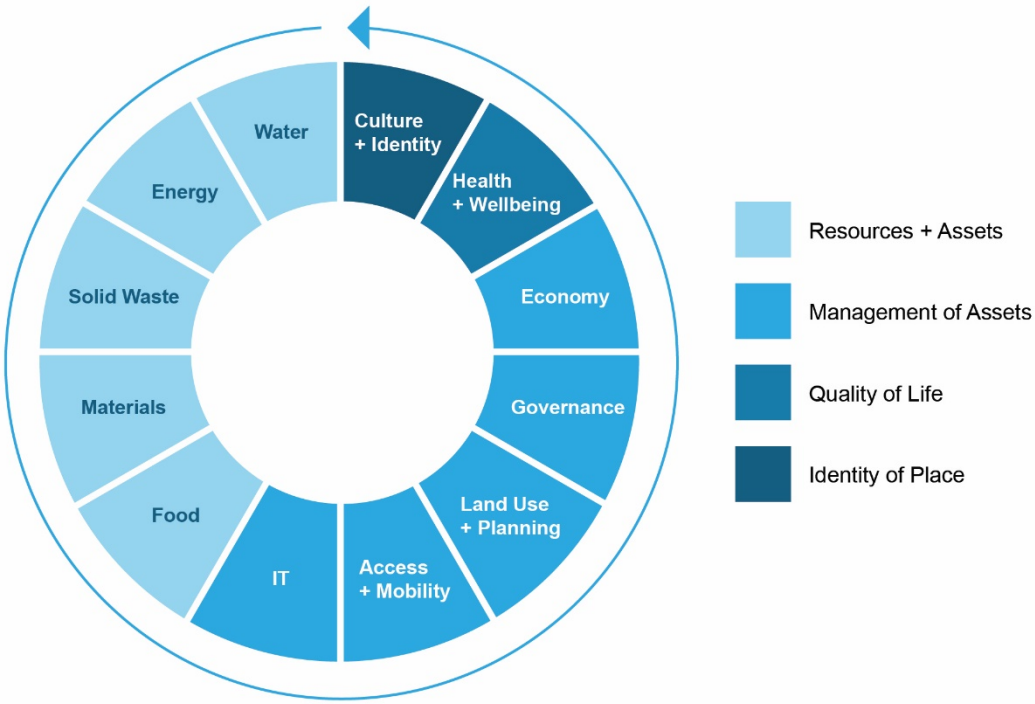
- Using a phased approach for the implementation of the land bridge, from a design/engineering and planning perspective, to allow for development as funding sources become available and market demands improve.
- Consider options for future stages of planning presented in a toolkit of relevant design/engineering activities and planning activities.
  - Potential engineering/design activities include: conduct other studies (e.g., analyses of noise and air quality impacts, traffic impacts), conduct life cycle cost aspects (LLC-Aspects) of a land bridge, develop a preliminary and final design (e.g., detailed architectural and engineering drawings), construction plan, and opening and operation planning.
  - Potential planning activities include: establishing milestones with key stakeholders (public engagement), developing/adopting a ReConnect Rondo land bridge community preferred concept/master plan,

incorporating the Rondo land bridge into relevant planning documents, use findings and recommendations from HIA, sustainability study, healthy communities initiative steps, and gentrification study.

Past Prosperity study

Lastly, the Past Prosperity study expanded ReConnect Rondo's scope of focus even further (Sævarsson, 2020). This study conducted an analysis of key economic indicators of Rondo's development since the 1940s (focusing on homeownership and costs of living). Additionally, this study used the Yorth Group's proprietary Restorative City Standard™ to assess equity in twelve "performance areas": water access, energy resiliency, food security, solid waste management, circular material strategies, technology infrastructure, transportation access & mobility, land use & planning, management & governance, local economy, health & well-being, and culture & identity (Sævarsson, 2020; Figure 9).

9. Restorative City Standard™



Note. Reprinted from *Restorative Rondo: Building equity for all. Past Prosperity Study*. Yorth Group.

Past Prosperity study recommendations

Based on their analyses, the Yorth Group recommended a number of strategies to secure equity generation, prevent displacement, and increase homeownership within the Rondo community (Sævarsson, 2020):

- **Create a catalyst for local jobs, career pathways, and local businesses through a circular economy hub in Rondo**, such as a community-owned Integrated Utility Hub (IUH) that incorporates urban agriculture, hydroponics, and a material remanufacturing program
- **Provide additional career pathways within the district, including education and training**
- **Apply Regenerative Urbanism principles to restore community well-being** through not only formally established parks, but also creating integrated opportunities on residential streets for pop-up parks, urban oases, pop-up cafes, art installations, and outdoor markets
- **Leverage opportunities for circular economic financing**

A deeper dive: Gentrification and equitable development

Gentrification and concerns about a land bridge ultimately leading to displacement was a concern raised repeatedly during the HIA process. Whether the land bridge becomes primarily a green space or location for new development, past projects have shown that these types of projects can have negative impacts on current community residents and lead to displacement or a loss of community identity. In this section of the report, we build on what was identified through the HIA to offer additional frameworks and tools that may be useful for ReConnect Rondo in its ongoing work.

Gentrification is a commonly used term, but one that is often politically charged and that lacks consistent definition. In this report, we borrow a definition that seemed to resonate with the concerns elevated by Rondo residents who participated in the HIA community advisory committee:

> **Gentrification is the process by which higher income households displace lower incomes residents of a neighborhood, changing the essential character and culture of the neighborhood (Kennedy & Leonard, 2001).**

It is important to recognize that neighborhood investment and revitalization can occur without displacing current residents or changing the fundamental feel and character. While the specific factors that lead to gentrification may vary in different neighborhoods, and the indicators below have limitations, these are factors that suggest gentrification is likely to occur or is underway (Figure 10). Additionally, as highlighted in Dolde's (2018) study of place-based gentrification in the Rondo community, there may be tension between "community-oriented ideas of gentrification and market or policy-driven ideas of the same phenomenon…. Community understandings of gentrification should not only be highlighted during research, but should also guide and structure the theory and application of gentrification research in a local context" (p. 26). Thus, ReConnect Rondo and their partners should work with community members to conceptualize, define, and measure gentrification within the local Rondo context, alongside more generalized indicators of gentrification such as those listed below.

10. Indictors of gentrification

Neighborhood features suggesting gentrification is likely	Neighborhood trends suggesting gentrification is occurring
High rate of renters	Shift from rental to greater homeownership
Ease of access to job centers (via freeway, public transit, etc.)	Increase in home down payment ratios and declines in Federal Housing Authority (FHA)-financing
High and increasing urban congestion	Influx of households and individuals with niche specialized or cultural interests (e.g., young professionals)
High architectural value in existing buildings, homes, and other spaces	
Comparatively low housing values	Influx of amenities that serve higher income levels (e.g., boutique retail stores, upscale restaurants, art galleries)

Adapted from Kennedy & Leonard, 2001

While adding more green space to a neighborhood has many potential benefits to physical and mental health, as well as creating new space for community connections to occur, new neighborhood development projects with these added amenities do not always benefit nearby communities, particularly lower-income neighborhoods. Parks can go unused by communities of color who feel unsafe or unwelcome in spaces because of experiences of discrimination and being excluded from processes that determine what the park looks like and how it will be used (Byrne, 2012). The creation of green space in urban settings can lead to increased property values, ultimately displacing community residents. An example of this is the High Line Rail in New York City, which turned an old rail line into a walking path with gardens. After the rail line was revitalized, nearby property values increased 103% between 2003 and 2011, a period when the United States was experiencing an economic recession (Wolch et al., 2014). To prevent these unintended impacts from occurring, some planners have advocated for prioritizing small-scale projects to create spaces beneficial for communities and less practical and appealing for developers (Schauman & Salisbury, 1998).

According to The Trust for Public Land's ParkServe mapping tool (n.d.), all current Rondo residents live within a 10-minute (1/2 mile) walk of a park. However, as discussed in the past prosperity study and public spaces survey, other external challenges impact the Rondo community's access to parks and green space, such as access to adequate leisure time, general neighborhood safety, and the safety of mobility infrastructure (Lindeke, 2019; Sævarsson, 2020). In future land use planning discussions (including, but not limited to the design of the Rondo land bridge), these challenges should be considered and addressed to ensure adequate access to green and public spaces within Rondo.

> *Compared to the pre-freeway era, the arterial streets of the Rondo Community Study Area have been greatly transformed. The combination of street widening, a narrowing of the sidewalks and pedestrian right-of-way, high traffic volumes, and high vehicle speeds create a perception and reality of danger that dramatically affects how these spaces can be used by people not driving in personal vehicles. Streets like Lexington Parkway, Dale Street, Rice Street, Concordia Avenue, St. Anthony Avenue, and Marion Boulevard all have the effect of eroding the quality of the public space on the streets and sidewalks. The present-day design restricts who can use it, and how welcoming and accessible these public spaces are along those corridors.*
>
> *-- Lindeke, 2019*

Current housing stock also gives into the likelihood of gentrification and displacement of community residents. An HIA conducted to explore potential impacts of the central corridor light rail line that runs along University Avenue in Saint Paul explored this topic in depth (PolicyLink, 2011). The final report explains that in neighborhoods with high vacancy rates and a weak housing market, new housing can fill in vacant lots without broader community impacts (PolicyLink, 2011). However, as that trend continues in communities with a stronger housing market, homes are renovated and sold at much higher prices, apartments become higher-price condominiums, and older buildings are demolished to make space for new construction. This latter scenario can lead to displacement without anti-displacement policies in place. The Rondo land bridge feasibility study commissioned by ReConnect Rondo found that, in the Rondo neighborhood, approximately 61% of housing is renter-occupied, a rate higher than the City of Saint Paul overall (Kaskaskia Engineering Group, LLC. & RKG, 2020). In addition, only 272 of the 5,115 housing units in the study area were vacant (5% of all housing units). Additionally, a high proportion of households in Rondo are cost-burdened by housing (i.e., paying 30% or more of their income for housing). In two out of three Rondo census tracts north of I-94, at least 50% of households are cost-burdened by housing (Figure 7).

If ReConnect Rondo wants to assess risk of gentrification in the future, the following indicators or risk factors of gentrification (borrowed from the Central Corridor HIA gentrification framework) may be of use (PolicyLink, 2011):

- Rising rents and home value
- Decreased racial diversity
- Increases in educational attainment of residents
- Increases in property values
- Close proximity to transit
- High density of amenities including youth facilities and public space
- High percentage of workers taking public transit
- High percentage of non-family households
- High percentage of buildings with three or more units
- High number of renter versus owner occupancy
- High number of households paying a large share of household income on housing (Housing Cost Burden)

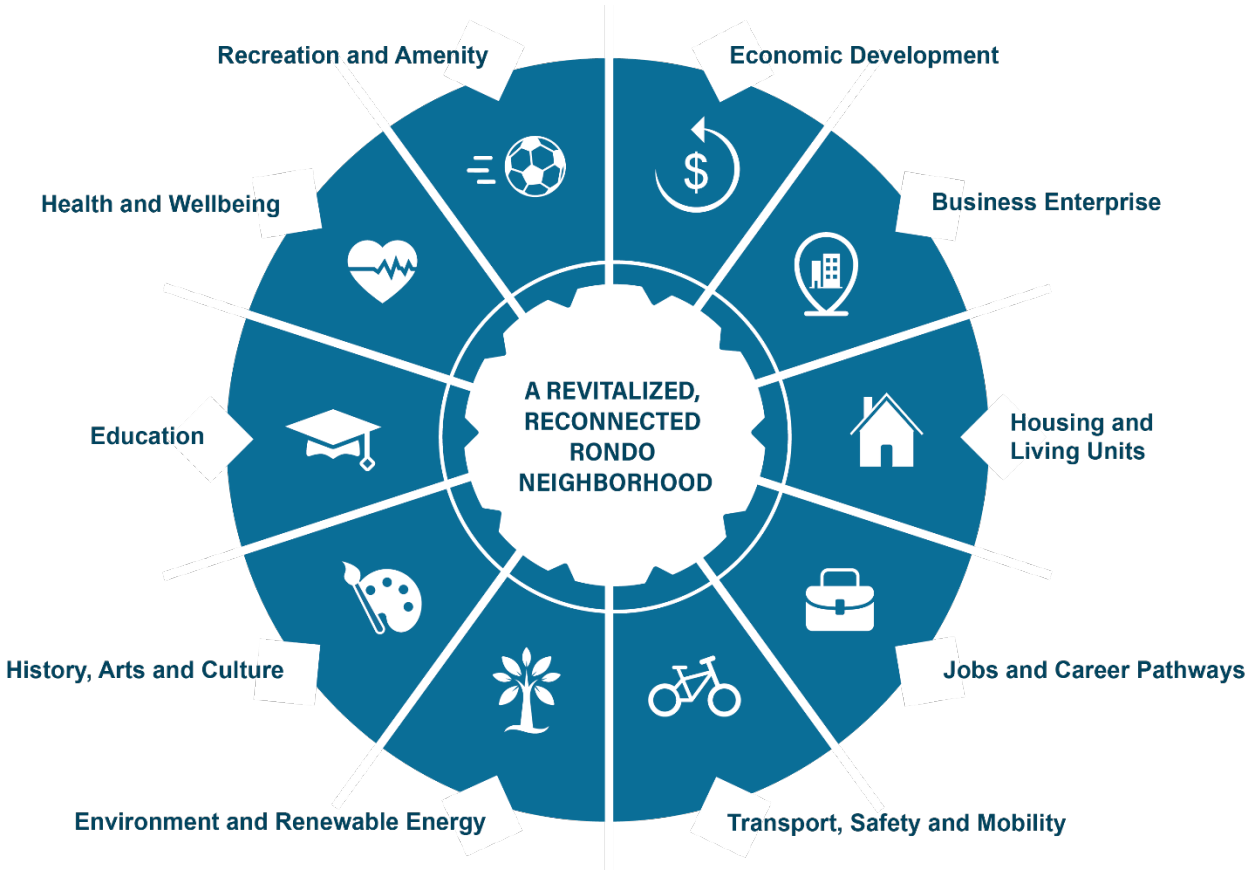
As stated in a report developed by the Urban Land Institute, ReConnect Rondo views the goal of the land bridge as an opportunity "to realize community ownership of the process, the physical places and spaces (atop the bridge), and the maintenance and programming of the asset moving forward. This includes increasing the opportunity for locally owned homes and businesses throughout the community" (Urban Land Institute, 2018, p. 13). The ULI report outlines several recommendations for strategies to monitor the occurrence of displacement and promote community ownership of businesses and homes.

As planning continues for a potential land bridge, protections need to be put in place to mitigate potential community harm that could occur through large-scale development. To avoid the unintended impacts of neighborhood development projects, such as the proposed land bridge concept, ongoing collaboration is needed by community members, planners, designers, and community developers to create spaces that align with the community's priorities. There are also a number of anti-displacement policies that can be implemented to mitigate unintended impacts. Examples of these include provisions requiring affordable housing in new development, rent stabilization programs for homes and small businesses, financial incentives for homeownership among current residents, or policies that incentivize hiring employees from the community.

Looking ahead

The HIA was a tool for beginning broader discussions about the land bridge concept to include considerations of community health and well-being. Through this HIA and ReConnect Rondo's ongoing community engagement and planning efforts, it is clear that a community-determined, iterative approach is needed to fully consider how a project with such potential to impact a community that has a history of being left out of decision-making can best be designed and implemented. The visual below (Figure 11), developed by ReConnect Rondo, highlights the areas the organization sees as areas to further explore through ongoing community engagement. In the field of public health, these are known as the social determinants that influence community health, well-being, and resilience.

11. The Rondo Neighborhood Ecosystem



Final thoughts and conclusions

Upon reflection on the Rondo land bridge HIA, HIA is an informative tool that is most effective when the scope and specifications of a project are set, the scope is narrow, and a decision-point is clear. Since the HIA, additional studies conducted by ReConnect Rondo and its partners have pointed to the desire of Rondo community members for decision-makers to consider many of the elements that are key to the revitalization of the Rondo neighborhood as identified in the Rondo Neighborhood Ecosystem (Figure 11). Moving forward in the Rondo land bridge planning process, assessments and processes for community engagement that consider the breadth and depth of potential community impacts, many of which affect health and well-being, will be critical. MnDOT planning processes in the Rondo neighborhood, as well as those of other key stakeholders, should involve community collaboration and be in alignment with community-driven needs and priorities. Planning a successful project will require ReConnect Rondo to work in close partnership with multiple government agencies and require these agencies to approach their work differently, in order to hear and respond to community concerns.

Currently, ReConnect Rondo and the broader community have concerns that Phase 2 of Rethinking I-94 will focus heavily on key infrastructure needs identified by MnDOT, such as pavement, safety, and mobility, rather than the interests of the community. MnDOT's priorities are not in alignment with what community members have defined as important concerns, which are the social, economic, and environmental impacts of the I-94 project. In October 2020, ReConnect Rondo sent a position paper to MnDOT outlining priorities that should be considered as part of the formal National Environmental Protection Act (NEPA) Environmental Impact Statement (EIS) process.

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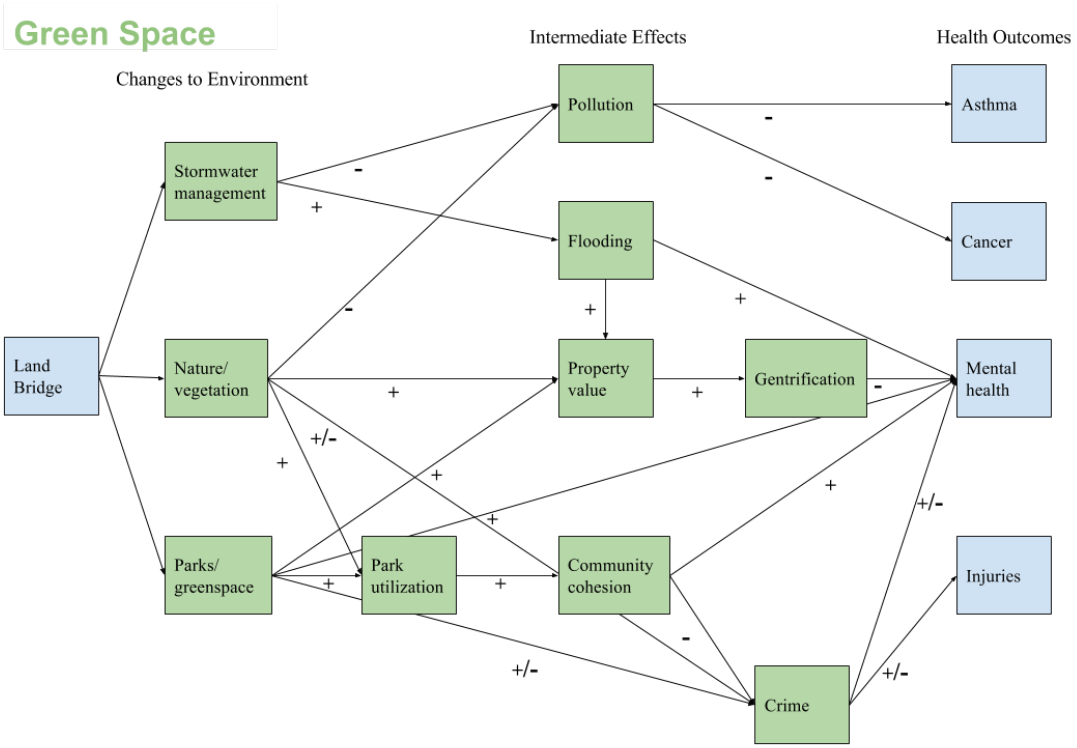
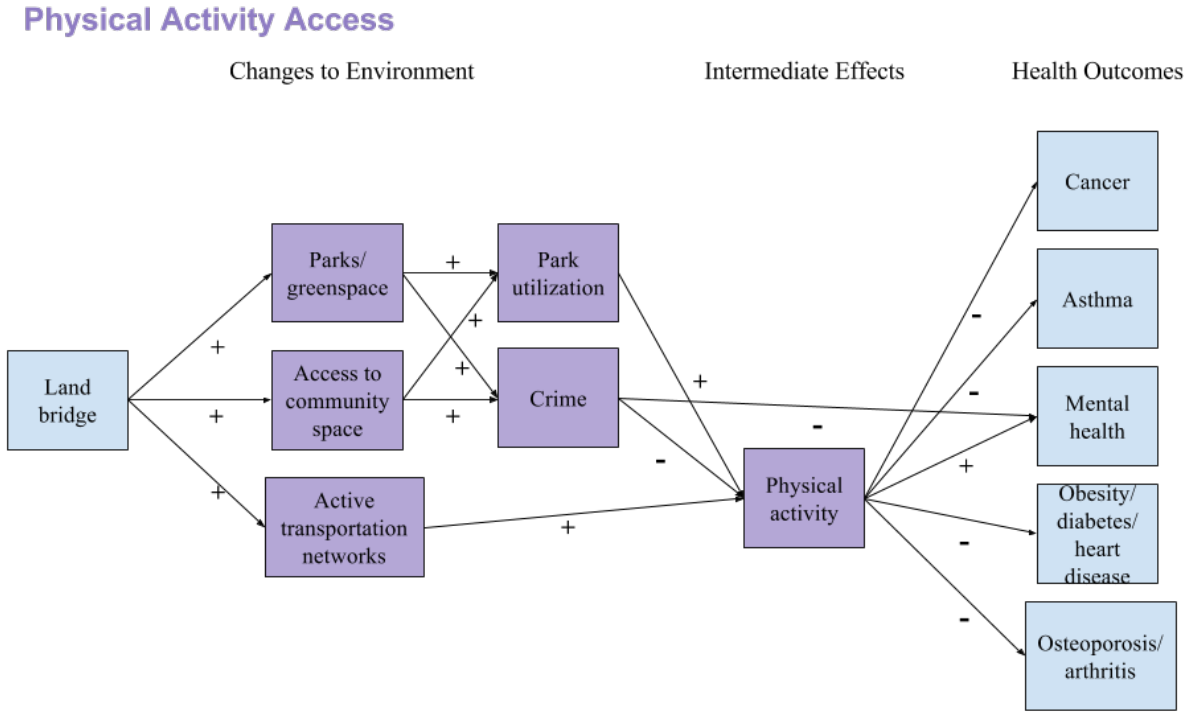
Appendix

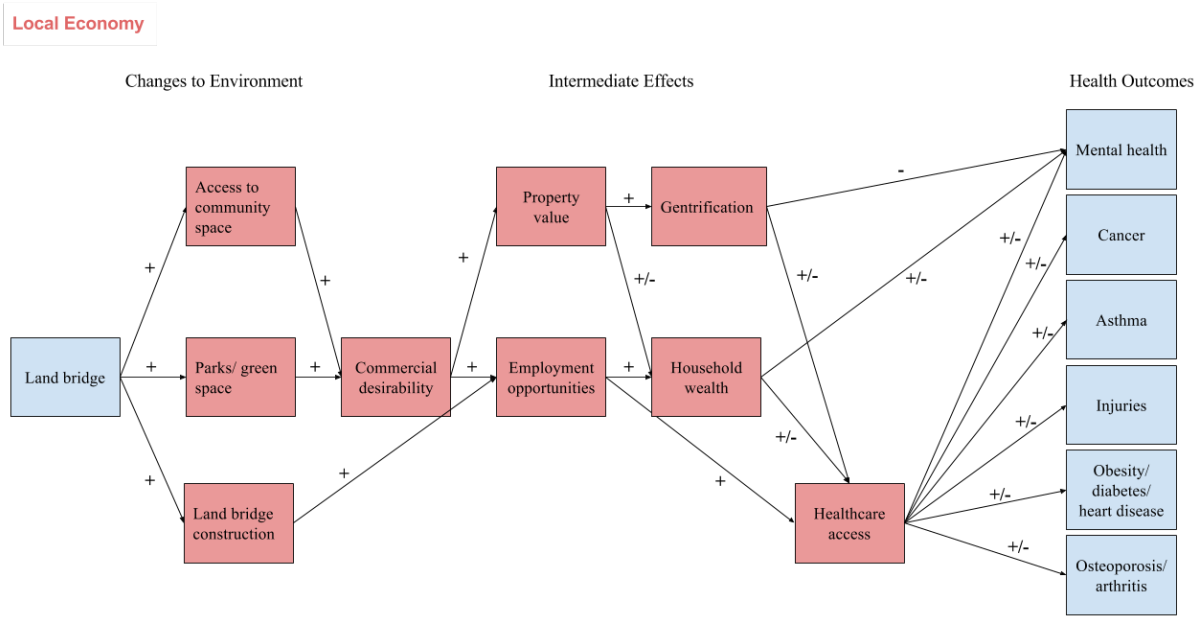
A1. HIA Pathway diagram: Green space



A2. HIA Pathway diagram: Access to opportunities for physical activity



A3. HIA Pathway diagram: Local economy



THE UNIVERSITY OF MINNESOTA
HUMPHREY SCHOOL OF PUBLIC AFFAIRS

Reconnecting Rondo:

A Component of the Health Impact Assessment on the Rondo Land Bridge

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submitted in partial fulfillment of the
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ABSTRACT
The historically African American neighborhood of Rondo, in St. Paul, Minnesota, was torn apart when Interstate 94 (I-94) freeway was constructed in the 1960s. The freeway followed a path through the heart of the neighborhood, displacing homeowners and businesses, and creating a chasm in the neighborhood with few points at which people could cross over the freeway from one side of the neighborhood to the other. The freeway construction is an example of environmental injustice inflicted on the community as a result of historical racism. The freeway's path through Rondo was seen as the path of least resistance. ReConnectRondo is an advocacy organization created to address the lingering effects of I-94's construction. ReConnectRondo has been exploring the idea of a freeway cap in the neighborhood. A Health Impact Assessment of the proposed land bridge, conducted in conjunction with the Minnesota Department of Transportation's "Rethinking I-94" study, will help ReConnectRondo to leverage funding and resources for the infrastructure project in the future. It will also codify the desires of the community regarding the form and programming of the bridge. This document analyzes the impacts that a land bridge would have on green space, physical activity access, and the neighborhood's local economy, and how changes in these three areas would subsequently impact the neighborhood's health outcomes. This paper is the culmination of an extensive community involvement process and technical research on the community's three health priority areas.

INTRODUCTION

The historic Rondo neighborhood, in St. Paul, Minnesota, overlaps with two existing city neighborhoods: the Frogtown neighborhood and the Summit/University neighborhood. Like many urban-residential areas in the mid-twentieth century, Rondo witnessed a large scale urban renewal infrastructure development project: the construction of the Interstate 94 (I-94) freeway. This freeway cut the predominantly African American neighborhood in half, negatively affecting numerous businesses and homes, as well as the spirit of the community. This report was prepared for ReConnectRondo (RCR), a community-based organization that is looking for ways to address the negative effects of urban renewal that manifested in the construction of I-94. This report focuses on ten census tracts, called the Rondo study area, that make up the historic area of the Rondo neighborhood (Figure 1). RCR has been working with Rondo community leaders and with the Minnesota Department of Transportation (MnDOT) to research the possibility of a land bridge in conjunction with MnDOT's "Rethinking I-94" project.[1] The study goals of the "Rethinking I-94" project include:

1. Developing a comprehensive, long-term and community-based approach to address I-94 study area needs
2. Better understanding who uses I-94, how they use it and what parts of the study area work/do not work for people
3. Gaining a stronger understanding of the condition of I-94 including bridges, walls and tunnels in the study area
4. Determining how to best address mobility needs on I-94

RCR's proposed land bridge would help to connect the physical landscape between the north and south sides of the highway. The land bridge would continue to allow cars to travel beneath a lid or cap, and would return land currently being utilized solely by the freeway, back to the community. This report explores how the health outcomes of residents might be affected by three key impacts of the proposed land bridge: green space, physical activity access, and the local economy. These key impacts were identified specifically by community members through an engagement and voting process. The construction of a land bridge and the effect it will have on these three areas could lead to both positive and negative health outcomes for community residents. These outcomes are discussed in the following sections.

[1] "Rethinking I-94," Minnesota Department of Transportation, accessed December 4, 2017, http://www.dot.state.mn.us/I-94minneapolis-stpaul/.

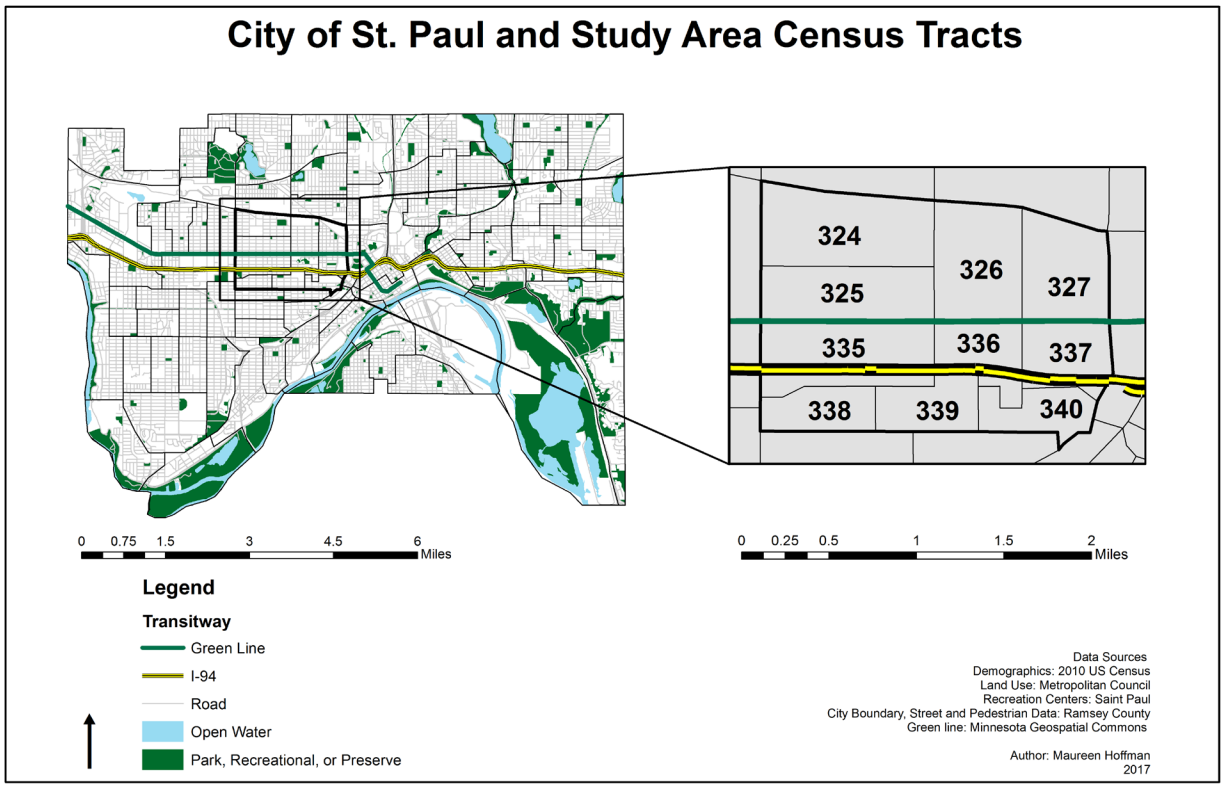

Figure 1: Rondo includes census tracts 324, 325, 326, 327, 335, 336, 337, 338, and 339.

HEALTH IMPACT ASSESSMENTS AS POLICY TOOLS

The International Association of Impact Assessment defines Health Impact Assessments (HIAs) as "a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to manage those effects."[2] HIAs are conducted as a way to influence a decision. They must be conducted prior to the decision being made so that they can be used as part of the decision-making process. The first step in an HIA is finding a decision point and determining how to best influence it. HIAs are most successful when they are responsive to the timing of the decision-making process. Once a decision point has been identified, and an HIA is seen as the best tool, the HIA can commence.

Successful HIAs follow six steps: screening, scoping, assessment, recommendations, reporting, and evaluation and monitoring. The screening step encompasses the identification of a decision point, and the determination that an HIA would be an effective and feasible way to impact that decision. RCR and St. Paul Ramsey County Public Health conducted the screening step, determining that the land bridge was a significant project that merited an HIA. RCR identified MnDOT's "Rethinking I-94" study as the decision point they wanted to influence. Additionally, they determined that the HIA process was one that could help amplify community voices and

[2] "Minimum Elements and Practice Standards for Health Impact Assessment" (North American HIA Practice Standards Working Group, April 2009).

concerns. While some policy formation processes do not allow for rigorous community engagement, the HIA process is well-suited to both allow and promote systematic, thorough engagement. The linear process, as outlined in Figure 2, allows for community input at each step, insuring that the resulting document can help to influence decision-makers while also representing community concerns.

Figure 2[3]: The HIA process includes six steps.

The scoping step helps to organize the process, and accumulate the necessary stakeholders with relevant expertise. The scoping step determines who will be in charge of the HIA, what specialists or practitioners' knowledge could be leveraged, key dates that the HIA needs to adhere to in order to influence the identified decision makers, and a broad setting of expectations and objectives. RCR is leading the process and creation of the final HIA document and has convened various committees to advise the process. They are using research assistants to assist in creating portions of the final HIA document.

The assessment step includes the identification of current health conditions in the neighborhood (called the baseline assessment), and the assessment of possible health impacts associated with the project. This report is concerned primarily with the assessment step of the HIA. A baseline

[3] Katherine Hirono et al., "Is Health Impact Assessment Useful in the Context of Trade Negotiations? A Case Study of the Trans Pacific Partnership Agreement," *BMJ Open* 6 (April 1, 2016): e010339, https://doi.org/10.1136/bmjopen-2015-010339.

profile of health in the study area gives a comparison point for future monitoring and evaluation, after the project is completed. The possible health impacts that are investigated speak to community-voiced priorities and concerns. Then, the relationship between the health impacts and the proposed project is examined. For example, research was conducted on how the proposed land bridge would impact green space in the study area.

After the assessment is done, recommendations are made on how the decision point could be changed to either mitigate negative health impacts or maximize health benefits. The HIA is then compiled into a technical document. It may also be summarized in brief documents that make for easy dissemination.

After the decision point has passed, the entity in charge, RCR, of the HIA should evaluate the project's effectiveness at influencing the decision. RCR should also continue to monitor the process and see if the health impacts identified in the HIA do indeed take place. Future datasets can be compared to the baseline data gathered in the HIA to see how health changed over a period of time. Any data collected may help to influence future projects by showing the importance of the HIA process in identifying problems and opportunities in projects.[4]

RECONNECT RONDO'S HIA PROCESS

The HIA process conducted by RCR has a strong focus on engagement. RCR's process emphasized and focused on this bottom-up approach, driven by engagement, as opposed to outreach, with the identified stakeholder. Outreach focuses on educating key stakeholders on issues, whereas, engagement typically employs outreach throughout its process, but is ongoing and involves key stakeholders in a project or policy process from its inception, implementation, and its review.[5] Engagement is important to ensure the community's voice is not only being heard, but is also affecting the design of the policy or project. It helps to meet the needs of the community, ensuring the project or policy is more effective when implemented.

HIA Planning Team

The HIA Planning Team was composed of St. Paul Ramsey County Public Health and Minnesota Department of Health (MDH). The Planning Team helped to inform RCR on how to effectively write and implement an HIA. In the first month of research for this report, Brenda Hoppe, a senior research scientist at MDH and member of the HIA Planning Team, advised the work. Her main role at MDH was the creation of and research for HIAs in the environmental impact assessment division. She guided the research on the numerous steps taken in the creation of the priority issue sections. Specifically, she advised the creation of effective pathway diagrams and how the organization of literature reviews. Pathway diagrams are important tools in HIAs and are part of the scoping phase. They are used to help organize and illustrate how the proposed physical change impacts health. Health impacts from large infrastructure projects and from policies are extremely complex. Pathway diagrams help to illustrate impacts and make connections more clear, while informing the baseline information that needs to be collected.

[4] "Minimum Elements and Practice Standards for Health Impact Assessment."
[5] Ronald D. Simpson, "Toward a Scholarship of Outreach and Engagement in Higher Education," *Journal of Higher Education Outreach and Engagement* 6, no. 1 (2000): 7–12.

Technical Advisory Committee

RCR engaged with the community and with the Technical Advisory Committee (TAC). The TAC was composed of representatives from MnDOT, Trust for Public Land, City Council members from the area, and the Minnesota Pollution Control Agency (MPCA). The role of the TAC was to inform RCR on how to create an effective HIA, provide resources, and to attend, engage with, and give updates at community meetings. All participants attended biweekly technical advisory committee meetings. At the meetings the committee received updates on the progress of the research and were able to ask questions about the research and the HIA process.

Community Advisory Committee

Approximately, once a month the Community Advisory Committee (CAC) would meet. The CAC is composed of Rondo residents and representatives from community-based organizations. CAC meetings are attended by the TAC and HIA Planning Team. The development of the HIA was driven by the community, giving the community authority over what the HIA focused on and how it was written.

The community advisory committee had the power to choose the health determinants the HIA focused on for its priority issues. The first project meeting focused on the research that had been performed over the summer, goal setting, and defining the scope of the HIA. This meeting informed the focus of the next meeting: identifying the focus of the health issues. The scoping from the first meeting influenced the discussion about which health issues the community found most important. RCR facilitated the conversation by having a large piece of paper at each table with guided questions. Each table talked amongst themselves about the questions and came to a consensus for each, writing them on the paper. The group then came together to discuss what each table had written. As the tables discussed, RCR staff wrote the different health determinants that were mentioned on posters in the front of the room. Next, the staff handed out dots for the community to put next to their top five health determinants. The health determinants with the highest votes by the end of the meeting were: youth, green space, the localized economy, and gentrification. To ensure all were able to have their voices heard, RCR sent out the entire list of possible health determinants to community members who could not make the meeting to vote. The final tally determined the top areas of focus: green space, physical health access, and the localized economy.

The scoping and voting phases influenced research work moving forward. The next step in the HIA process was the creation of pathway diagrams for each health determinant. To focus the health impacts from each determinant, other health issues brought up in meetings were incorporated, or would have a place in the recommendations section of the report. The final pathway diagrams were presented at the next community advisory committee for input. The community provided feedback on all three diagrams, helping to focus the recommendation sections to ensure the HIA serves the current community.

One of the main challenges of the project was the different timelines between the Rondo community and MnDOT. The community's timeline is longer than the deadline for project submissions for MnDOT's "Rethinking I-94" study. RCR needed to find ways to mediate the different timelines, and to make compromises without the community feeling they were losing their voice throughout the process. Transparency and engagement throughout the process were

employed to help mitigate the timeline disparities and to build trust between the community and the government agencies. The TAC attended community meetings to answer community questions and hear their concerns. MnDOT's representative gave presentations to update the community on the "Rethinking I-94" study, and voice what the agency would find the most convincing while reading the report.

PRIORITY AREAS

Green Space

Pathway Diagram

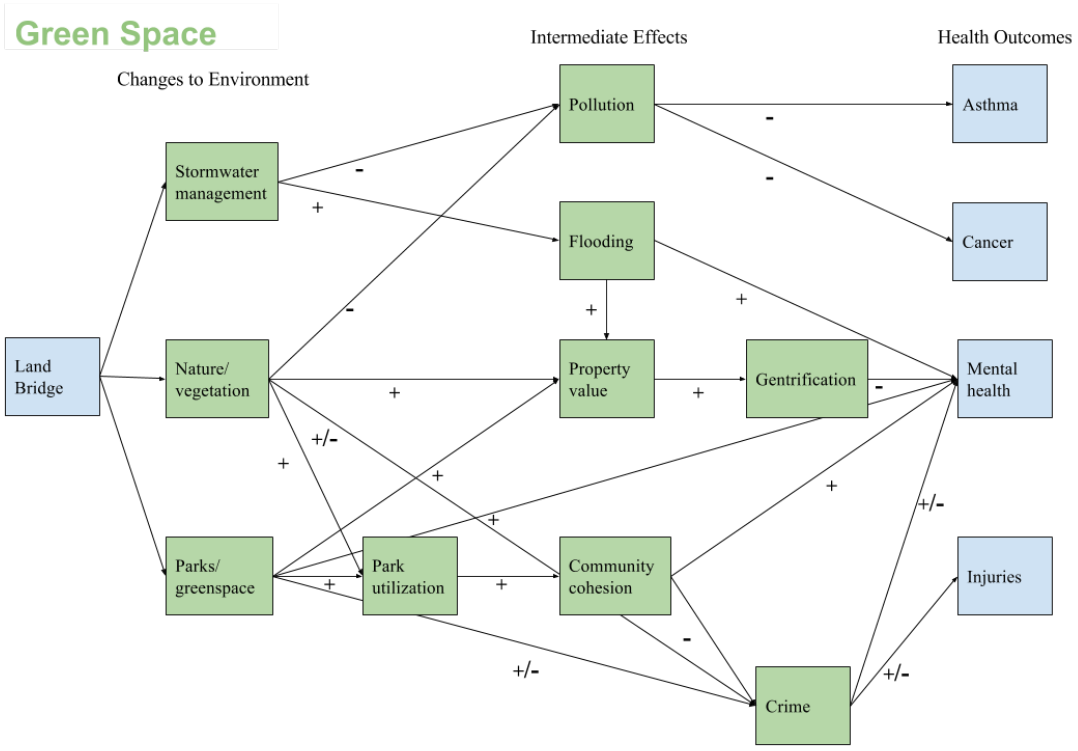

Figure 3: Green space pathway diagram. Each arrow shows a causal change. The pluses and minuses imply increases and decreases the effect the change would have.

Green space, as defined by the Oxford Dictionary, is an area of grass, trees, or other vegetation that is set apart for recreational or aesthetic purposes in an urban environment. Green spaces can have a number of positive impacts on a community, ranging from health benefits to increased air and water quality.[6] Green spaces can also have negative effects on a community. These can range from increasing property values leading to displacement, or feelings of being unsafe if the green space is not properly maintained. How a green spaces affects a neighborhood depends on its maintenance, its programming, how it is designed, and for whom it is designed. Figure 3 shows the pathway from increased green space on the land bridge to its possible health outcomes.

Issue

[6] "Green Space | Definition of Green Space in English by Oxford Dictionaries," Oxford Dictionaries | English, 2017, https://en.oxforddictionaries.com/definition/green_space.

The study area's total land area is 1,666 acres, which composes roughly 4.6% of St. Paul's total land area. Figures 4 and 5 show the distribution of land cover types in the study area and in St. Paul. The study area has significantly less canopy coverage, and significantly more impervious surfaces compared to St. Paul. The study area's total canopy coverage is 416.57 acres, composing roughly 25% of the total area. In St. Paul, tree canopy composes roughly 33% of the identified land cover type, almost eight percentage points higher than the study area. It should be noted, that the majority of St. Paul's tree canopy is found along the Mississippi River where development is prohibited.

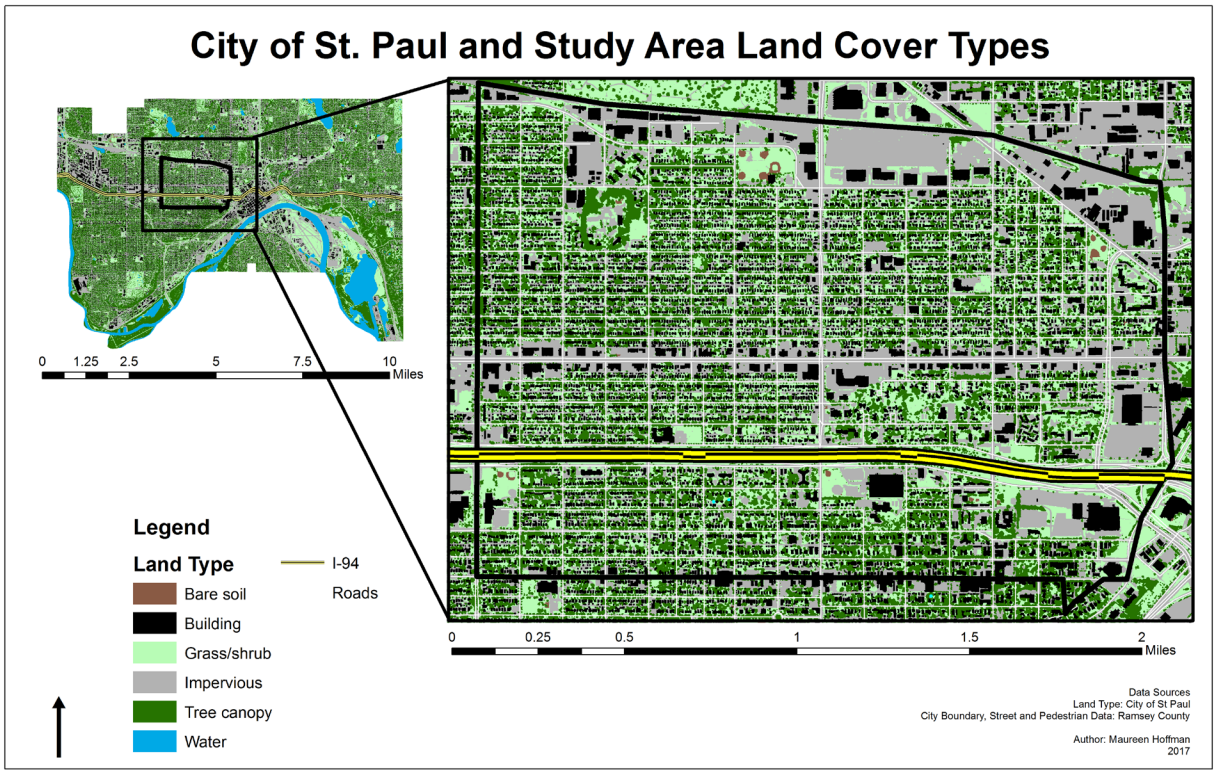

Figure 4: Map comparing overall land cover type of the Study Area and the City of St. Paul

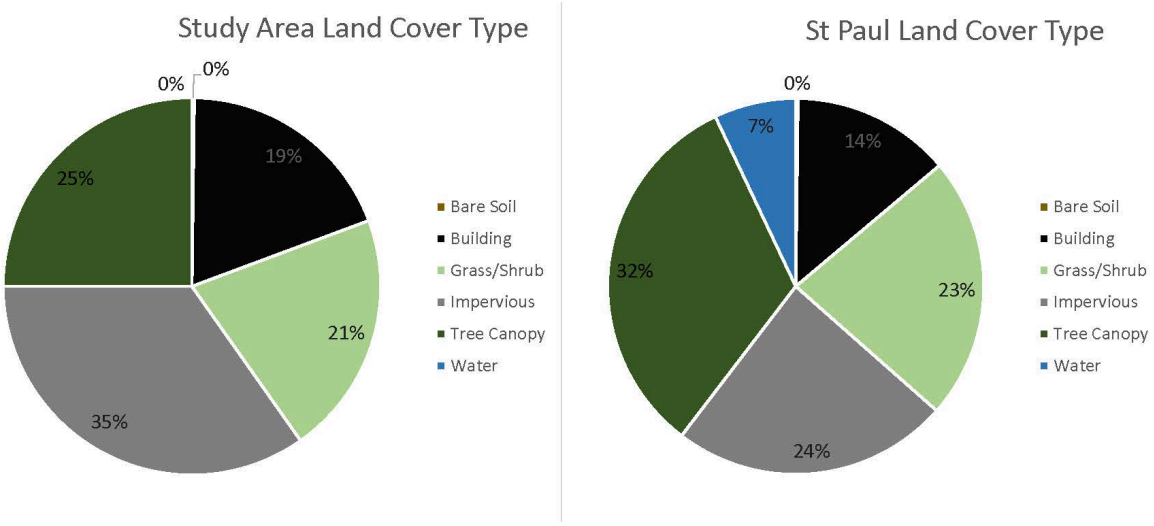

Figure 5: Study Area and St. Paul land cover type percentages

The study area has a total of 10 parks in its boundaries including: Frogtown Park and Farm, Carty Park, Central Village Park, and the Martin Luther King Recreation Center. The study area has 56.23 acres of park space in total. The average park is roughly five acres, ranging from .65 to 13.65 acres. The National Recreation and Parks Association recommends that for every 1,000 residents there is 10 acres of park space. The study area's parks do not meet this recommendation.[7] The St. Paul Parks Department needs to increase the total acreage of parkland in the study area by 71.96 acres to meet the recommendation. Figure 6 shows the location of park space in the study area.

[7] "2017 NRPA Field Report Park and Recreation Agency Performance Benchmarks" (National Recreation and Parks Association, 2017).

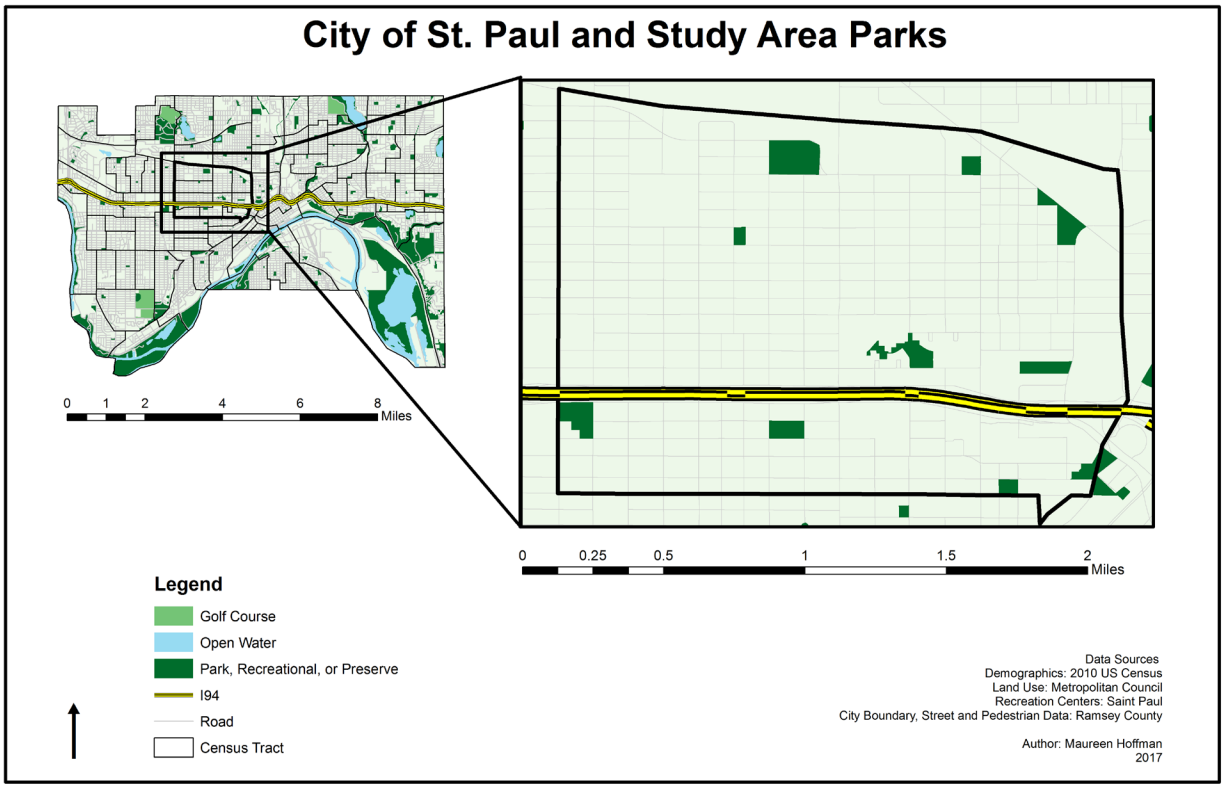

Figure 6: Map comparing City of St. Paul and the Study Area's parkland.

The Capitol Region Watershed is a local governing unit, whose mission is to protect, manage, and improve water resources within its jurisdiction.[8] The study area is located within their jurisdiction. The watershed accomplishes its mission through permitting, monitoring, best management practices installation (rain gardens, swales, tree trenches, etc.), education, and funding. Green infrastructure is being employed in St. Paul due to the recognition that natural elements provide ecosystem services and introduce positive aesthetics into the urban landscape.[9]

Figure 7 shows the location and types of best management practices (BMPs) installed in St. Paul and the study area. Figure 7 compares the percentage of BMP types installed in the study area and the Capitol Region Watershed district. Capitol Region's district expands north of St. Paul, and does not encompass all of east St. Paul. The study area has a total of 111 BMPs installed within its boundaries. These BMPs range from enhancing water quality to minimizing the amount of runoff entering the storm sewer at one time.

The type of BMP installed is determined by site specific factors. BMPs are chosen typically on their effectiveness for the chosen purpose (improve water quality, retention, etc.) and cost effectiveness. The study area has 83 bioretention BMPs, composing 75% of the total BMPs installed. Bioretention BMPs hold water to limit stormwater runoff, and provide ecosystem services to treat and filter the water that is being held. Notably, during the construction of the

[8] "What Is the Capitol Region Watershed District? :: Capitol Region Watershed District," accessed December 4, 2017, http://www.capitolregionwd.org/watershed-information/what-is-crwd/.
[9] Sarah Rudolf, "Health Impacts of St. Paul's Emerald Ash Borer Management Plan" (Minnesota Pollution Control Agency, July 2015).

Green Line Light Rail, Capitol Region Watershed District jumped on the opportunity to build and demonstrate stormwater BMPs in an urbanized area on a linear tract of land.[10] During this project tree trenches and an infiltration basin were installed in the study area. These projects are helping to prevent polluted water from entering the Mississippi, and in tandem with the other projects on the tract, remove 80 pounds of phosphorus and 40,000 pounds of sediment annually. The percentage of bioretention BMPs is consistent with the overall Capitol Region Watershed district, which has 899 bioretention basins composing 61% of total BMPs installed.

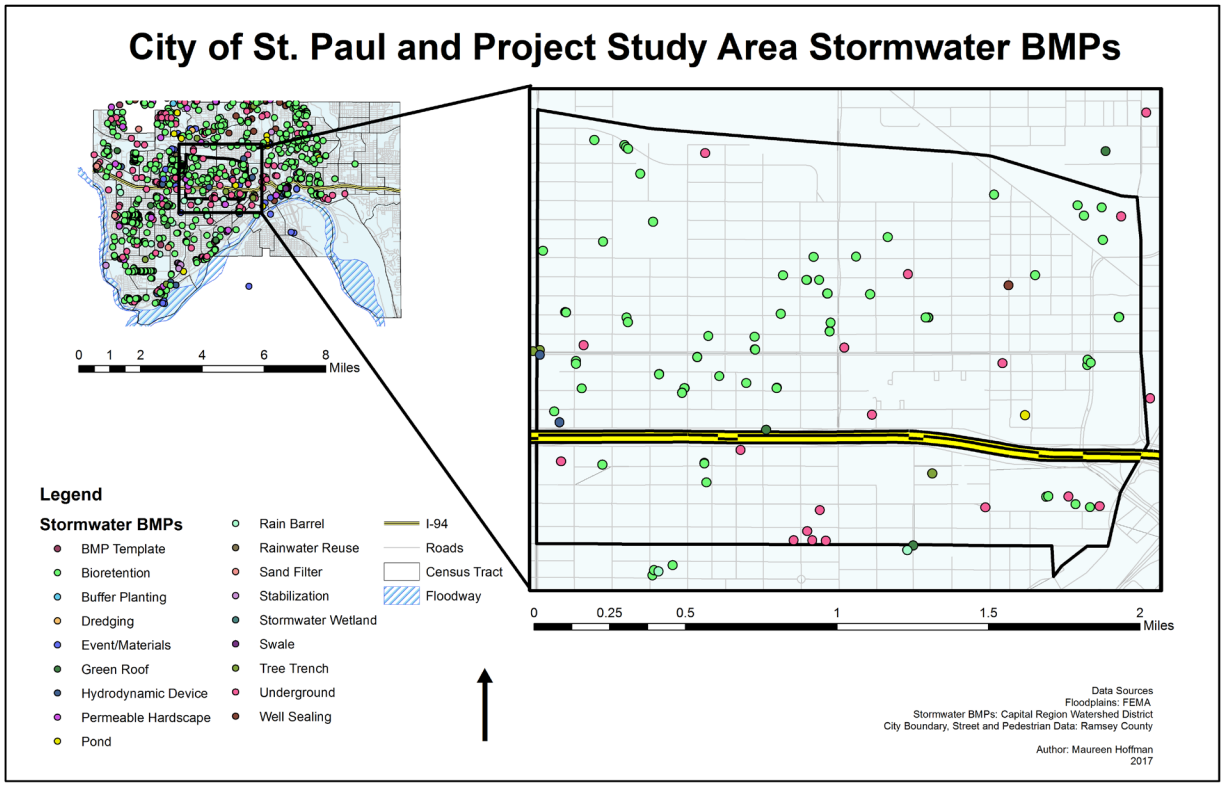

Figure 7: Map showing stormwater management BMPs installed by Capitol Region Watershed in the City of St. Paul and in the Study Area. The right portion of the City is not in the Capitol Region Watershed.

Air quality in the study area is monitored by the MPCA. To measure air quality MPCA has installed air quality monitoring stations throughout the Twin Cities. The monitoring station nearest to the study area is found at the intersection of Dale Street and Thomas Avenue. The station monitors for fine particles and air toxics (carbonyls, metals, and volatile organic compounds), pollution typically emitted from automobiles. Over a study conducted from 2013 to 2014 the MPCA found:

- All average daily fine particle emissions were below the daily standard.
- Average daily fine particles measured at the Thomas-Dale site were generally higher than values at most other sites, but followed a similar daily trend as other metro sites.
- Of the 74 air toxic pollutants measured, 42 pollutant levels were so low they were not detected.

[10] "Green Line Green Infrastructure Practices – Water Quality :: Capitol Region Watershed District," accessed December 4, 2017, http://www.capitolregionwd.org/our-work/watershed-planning/cclrt_wq/.

- All air toxic values were below health benchmarks except for formaldehyde. Formaldehyde is emitted as exhaust from automobiles.[11]

Green Space and Health

When green spaces are designed with the community in mind, they can lead to greater community cohesion, cause a decrease in crime, increase mental well being, decrease stress, and increase air and water quality. There continues to be mounting evidence that green space is associated with health benefits, including lower mortality rates.[12] In contrast, green spaces that do not foster a sense of ownership or promote utilization can lead to a decrease in property value, increase fear and stress in residents, and provide a space for criminal activity.

Research has shown that green space can be beneficial to human mental health and well being. A study performed in Wisconsin showed that higher levels of neighborhood green space were associated with lower levels of stress, anxiety, and depression.[13] A similar study found that decreased distance and an increased proportion of green space within the larger neighborhood resulted in decreased anxiety and increased mental health.[14] The same study also suggests that the mental health benefits resulting from green space is associated with the active participation and use of the space.

Children, specifically, benefit from proximity to and use of green space. Green space has been shown to help to lessen the effects of attention deficit disorder (ADD) by supporting attentional functioning.[15] The results of the study indicated that children with ADD functioned better than usual after utilizing green spaces. Green space can also help to increase self discipline in children. Children growing up in urban settings, particularly, low income neighborhoods are at risk for academic underachievement, and other negative outcomes. A study published in the Journal of Environmental Psychology found that increased proximity to green space, including being able to view it from their home, increased self-discipline in girls.[16]

Green space can negatively affect residents and users if not properly maintained and designed. Environmental and social cues have been shown to evoke perceived and real fears of a green space.[17] Environmental cues that can evoke fear about a green space include the following: low

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[11] Rudolf, "Health Impacts of St. Paul's Emerald Ash Borer Management Plan."

[12] Elizabeth Richardson et al., "The Association between Green Space and Cause-Specific Mortality in Urban New Zealand: An Ecological Analysis of Green Space Utility," *BMC Public Health* 10 (May 11, 2010): 240, https://doi.org/10.1186/1471-2458-10-240.

[13] Kirsten M. M. Beyer et al., "Exposure to Neighborhood Green Space and Mental Health: Evidence from the Survey of the Health of Wisconsin," *International Journal of Environmental Research and Public Health* 11, no. 3 (March 21, 2014): 3453–72, https://doi.org/10.3390/ijerph110303453.

[14] D. Nutsford, A. L. Pearson, and S. Kingham, "An Ecological Study Investigating the Association between Access to Urban Green Space and Mental Health," *Public Health* 127, no. 11 (November 1, 2013): 1005–11, https://doi.org/10.1016/j.puhe.2013.08.016.

[15] Andrea Faber Taylor, Frances E. Kuo, and William C. Sullivan, "Coping with Add: The Surprising Connection to Green Play Settings," *Environment and Behavior* 33, no. 1 (January 1, 2001): 54–77, https://doi.org/10.1177/00139160121972864.

[16] Taylor, Kuo, and Sullivan.

[17] Lisa J. Jorgensen, Gary D. Ellis, and Edward Ruddell, "Fear Perceptions in Public Parks: Interactions of Environmental Concealment, the Presence of People Recreating, and Gender," *Environment and Behavior* 45, no. 7 (October 1, 2013): 803–20, https://doi.org/10.1177/0013916512446334.

lighting, litter, poor maintenance, and landscapes that seem unruly and allow many hiding spots for attackers. Individuals also rely on the presence of other people utilizing the park to feel safe. Green spaces must be planned with the primary users' needs in mind. If the green space is not planned as such, residents will not utilize the space, and it will fall into disrepair resulting in a negative effect on mental health. Use, maintenance, and environmental stewardship are all directly related.

Environmental and social conditions and crime have complex interactions. Crime is typically a perceived fear in a green space. In reality, this does not necessarily reflect crime statistics.[18] There are varying relationships found between green spaces and crime. A study in Philadelphia showed that neighborhood parks were associated with increased levels of crime.[19] Certain characteristics of parks that promote community use and interaction, such as a soccer field, were found by another study to be associated with reduced crime. In Baltimore, a study found a strong inverse relationship between violent crimes and tree canopy, as tree canopy displays stronger social capital.[20]

Improved green spaces can also lead to negative impacts on a community, specifically lower income communities. The creation of green space to help address environmental justice issues and health disparities can result in creating a community amenity leading to increased housing costs and property values.[21] The rise in housing costs and property values can lead to gentrification and the displacement of the residents the space was supposed to benefit. The Center for Disease Control and Prevention (CDC) states that the displacement of residents caused by gentrification leads to negative health impacts including changes in stress levels, injuries, mental health, violence, and crime.[22]

The amount of trees and tree canopy coverage is specifically important in lower income neighborhoods. Low income neighborhoods experience high health inequities relating to air pollution. Most low income neighborhoods are located near major sources of pollution (highways, factories). Exposure to air pollution can increase asthma, cancer, cardiovascular disease, and respiratory illness.[23] Asthma is an illness that directly affects lung function and overall health. It is affected, exacerbated, and sometimes even caused by air pollution. Children and teenagers are at a higher risk than adults to the effects of air pollution on lung function since they engage in higher levels of outdoor physical activity, and have immature lungs. The elderly are also more susceptible to air pollution as aging bodies are at a greater risk to respiratory issues.[24]

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[18] "Urban Green Spaces and Health: A Review of Evidence" (WHO Regional Office for Europe, 2016).
[19] Elizabeth Groff and Eric S. McCord, "The Role of Neighborhood Parks as Crime Generators," *Security Journal* 25, no. 1 (2012): 1–24.
[20] Austin Troy, J. Morgan Grove, and Jarlath O'Neil-Dunne, "The Relationship between Tree Canopy and Crime Rates across an Urban–rural Gradient in the Greater Baltimore Region," *Landscape and Urban Planning* 106, no. 3 (2012): 262–70.
[21] Jennifer R. Wolch, Jason Byrne, and Joshua P. Newell, "Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities 'just Green Enough,'" *Landscape and Urban Planning* 125, no. Supplement C (May 1, 2014): 234–44, https://doi.org/10.1016/j.landurbplan.2014.01.017.
[22] "CDC - Healthy Places - Health Effects of Gentrification," accessed December 4, 2017, https://www.cdc.gov/healthyplaces/healthtopics/gentrification.htm.
[23] "American Lung Association," Website, Www.lung.org (American Lung Association, n.d.).
[24] "American Lung Association."

Trees improve air quality through a number of different chemical and physical interactions. They convert carbon dioxide into oxygen through the chemical process of photosynthesis, uptake gaseous air pollution, and intercept particulate matter. The process of pollution absorption is effective in removal of three criteria pollutants listed by the EPA: NO2, ozone, and SO2.[25] Criteria pollutants have been determined by the EPA as the most common air pollutants, and as a result, have national air quality standards levels. Certain trees can impair air quality by emitting pollen, which can cause seasonal allergies and irritate lung related illnesses.

Impervious surfaces increase stormwater runoff, decrease overall water quality, and increase the effects of the urban heat island.[26] The urban heat island effect describes built up environments that are hotter than the surrounding rural areas due to the increase of impervious surfaces.[27] The urban heat island can increase energy consumption, air pollutants, and greenhouse gases.[28] The increased daytime temperatures, and reduced nighttime cooling caused by the urban heat island can exacerbate heat waves, increasing the negative human health effects caused by thermal stress.[29] Thermal stress affects human health by contributing to general discomfort, respiratory problems, heat stroke, and mortality.

As stated above, impervious surface coverage increases stormwater runoff. Stormwater runoff and improper stormwater management affects human health by potentially causing flooding, leading to economic and health impacts. Flooding can cause damage to homes, buildings, and other infrastructure, mold, bacteria growth, and stress. Stormwater runoff can also impact drinking water and recreational water quality as it carries a bacteria and other harmful viruses. A study performed on the health effects of inadequately managed stormwater found that runoff can carry *Cryptosporidium*, a parasite that causes gastrointestinal distress. Those at the greatest risk are children, elderly, pregnant women, and those with an autoimmune disease.[30] Stormwater can also carry harmful bacteria (fecal coliform) into recreational waters. Exposure to fecal coliform can cause ear and eye discharge, gastrointestinal problems, and rashes.[31]

Urban forests and vegetation also help to improve and protect water quality. Tree canopy intercepts rainfall, helping to slow its rate, ultimately reducing the total volume of stormwater runoff.[32] Trees and vegetation help to stabilize slopes and soils reducing erosion. Native plants

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[25] Jorgensen, Ellis, and Ruddell, "Fear Perceptions in Public Parks."
[26] Chester L. Arnold Jr and C. James Gibbons, "Impervious Surface Coverage: The Emergence of a Key Environmental Indicator," *Journal of the American Planning Association* 62, no. 2 (June 30, 1996): 243–58, https://doi.org/10.1080/01944369608975688.
[27] OAR US EPA, "Heat Island Effect," Collections and Lists, US EPA, February 28, 2014, https://www.epa.gov/heat-islands.
[28] Hashem Akbari, "Energy Saving Potentials and Air Quality Benefits of Urban Heat Island Mitigation" (Ernest Orlando Lawrence Berkeley NationalLaboratory, Berkeley, CA (US), August 23, 2005), https://www.osti.gov/scitech/biblio/860475.
[29] Jianguo Tan et al., "The Urban Heat Island and Its Impact on Heat Waves and Human Health in Shanghai," *International Journal of Biometeorology* 54, no. 1 (January 1, 2010): 75–84, https://doi.org/10.1007/s00484-009-0256-x.
[30] Stephen J. Gaffield et al., "Public Health Effects of Inadequately Managed Stormwater Runoff," *American Journal of Public Health* 93, no. 9 (September 2003): 1527–33.
[31] Gaffield et al.
[32] "Urban Forests Improve Water Quality - eXtension," accessed December 4, 2017, http://articles.extension.org/pages/67763/urban-forests-improve-water-quality.

have deep roots to intake more stormwater, helping to reduce flooding events and the amount of stormwater entering waterways. Similar to air quality, trees have both a positive and negative relationship with water quality. Trees can negatively impact water quality when particulates that were caught on the leaf surface are washed off during rain events.[33] Leaf litter and tree debris in urban areas are stormwater pollutants, which contribute to phosphorus loads. Regular street sweeping can help to minimize the negative effects tree debris can have on water quality.

Impact Assessment: Green space and the land bridge

The added green space from the land bridge could help the community to meet the National Park Service's recommended standards of amount of green space per resident. The increased usable green space could help to improve mental well being in the study area. In 2015, the study area's population with mental health reported as "not good" for 14+ days among adults aged 18+ years was 12.72%, higher than St. Paul's at 10.00%.[34] Accessible green space has been proven to help improve feelings of anxiety, depression, and stress. Green space also helps to lessen feelings of loneliness and promote community social cohesion by increasing interactions.[35] Community cohesion is important in building pride and feelings of stewardship in a neighborhood. To limit the risk of the space falling into disrepair, resulting in increase feelings of stress and fear, the green space should include community amenities that promote interaction.

In 2016, 1,179 crimes were reported in the study area. Crimes that occurred in the study area composed roughly 9.92% of total crimes that took place in St. Paul. Figure 8 shows the breakdown of the types of crimes reported throughout the neighborhood in 2016. Theft and motor vehicle theft were the highest reported crimes in the study area in 2016. This data was gathered from the St. Paul 2016 Crime Report, and was analyzed via police grid not census tract. Additional green space that is utilized by the community can increase community cohesion and the amount of eyes on the street. The land bridge, if designed correctly, could help to reduce the number of crimes that take place on the proposed land bridge.

[33] David J. Nowak, "The Effects of Urban Trees on Air Quality," *USDA Forest Service*, 2002, 96–102.
[34] "Minnesota Compass Custom Profile: Census Tracts in Rondo," Minnesota Compass, accessed December 4, 2017, http://www.mncompass.org/profiles/custom/custom-profile?report_id=28f4915c22db2cd61935b1fc7ca0413c&location=tc_region&compare=false.
[35] "Social Contacts as a Possible Mechanism behind the Relation between Green Space and Health - ScienceDirect," accessed November 23, 2017, http://www.sciencedirect.com/science/article/pii/S1353829208001172.

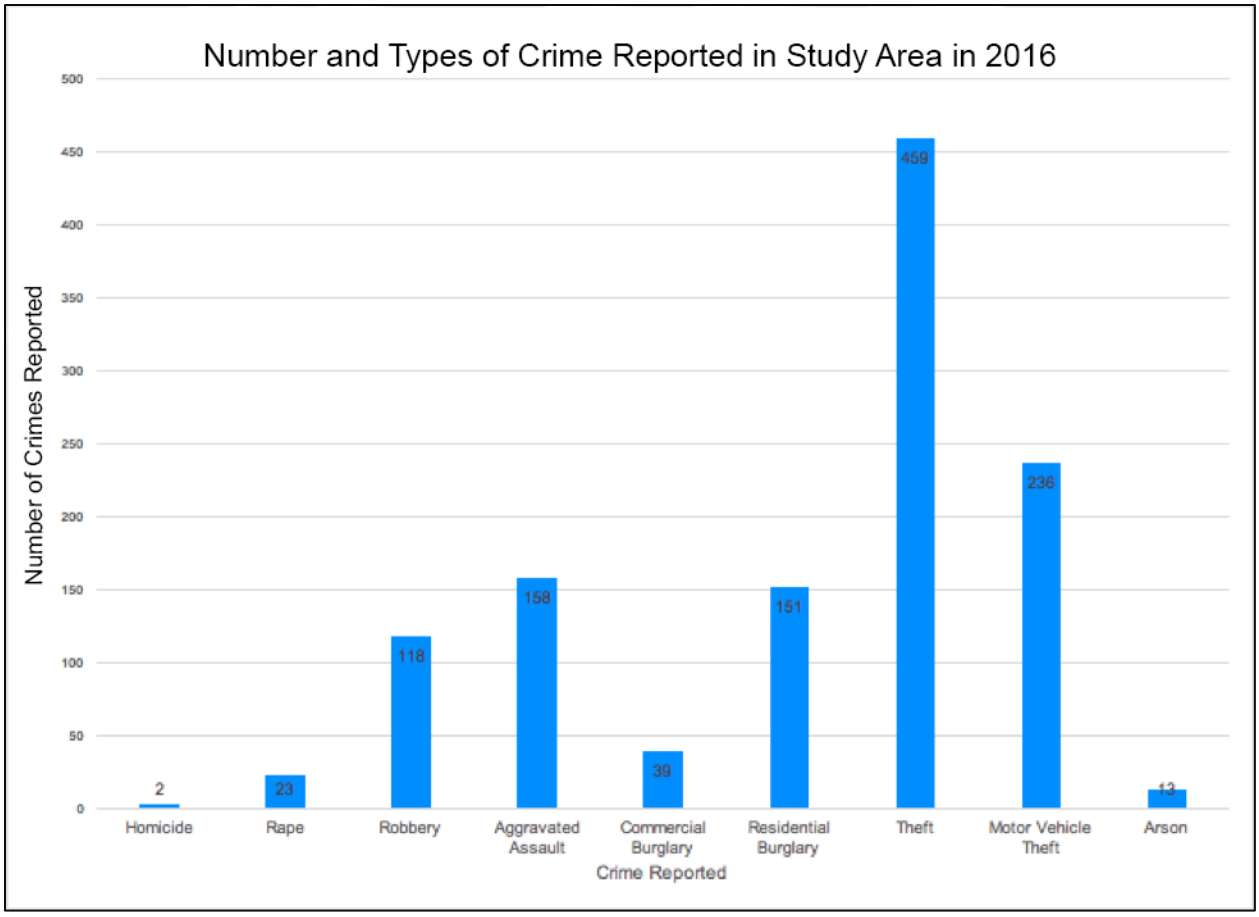

Figure 8: The bar graph shows the number and types of crimes reported in the study area in 2016. Data for this graph was sourced from the 2016 City of St. Paul Police Crime Report.[36]

The study area has roughly 416.57 acres of tree canopy. As stated above, the number of trees, and more specifically tree canopy, can positively impact air quality by removing air pollution by intercepting particulates and absorbing gaseous pollutants.[37] As stated in the Baseline section, all air toxic values were below health benchmarks except for formaldehyde. Exposure to formaldehyde in air pollution can cause irritation of the eyes, nose, and throat. Exposure to high levels can cause throat spasms, a buildup of fluid in the lungs, lead to asthma/bronchitis, and in very extreme cases death.[38] The International Agency for Research on Cancer has designated formaldehyde as a carcinogen.

[36] Todd Axtell, "2016 City of St. Paul Police Crime Report" (City of St. Paul Police Department, n.d.), https://www.stpaul.gov/sites/default/files/Media%20Root/Police/2016CrimeReport.pdf.
[37] E Mcpherson, David Nowak, and R A. Rowntree, *Chicago's Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project. (Includes Executive Summary). Forest Service General Technical Report (Final)*, 2017.
[38] "Pollutant Fact Sheet," accessed December 4, 2017, http://apps.sepa.org.uk/spripa/Pages/SubstanceInformation.aspx?pid=57.

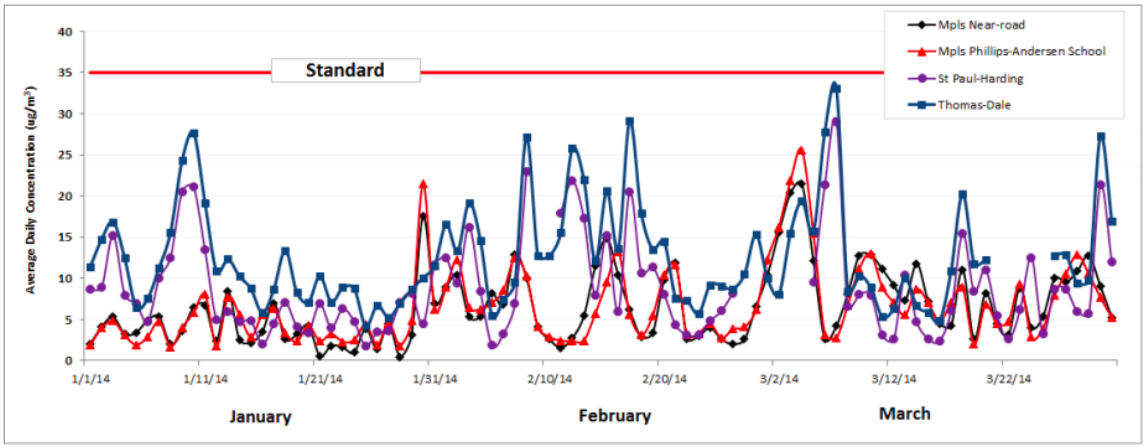

Figure 9: Average daily PM2.5 values at all St. Paul-Minneapolis air monitoring stations from January 1 – March 31, 2014. Source: MPCA's Community Air Monitoring Project's Thomas-Dale Neighborhood Summary Report. [39]

Figure 9 shows the average daily PM2.5 (particulate matter) at the Thomas-Dale monitoring site and other monitoring sites in the metro area. Particulate matter is small and light enough to be airborne, posing a threat to human health because it is inhalable. Fine particles were on average higher at the Thomas-Dale monitoring site than elsewhere in the metro. Particulate matter caused by humans is created from combustion engines, solid fuel, erosion of pavement, and industry. Health effects from PM2.5 can occur from short and long- term exposure. Short-term effects can cause aggravation of asthma, respiratory symptoms and an increase in hospital admissions.[40] Long-term effects from PM2.5 include: increased mortality from cardiovascular and respiratory diseases, and lung cancer.[41]

The land bridge could increase the study area's urban forest and canopy coverage. The increase in tree canopy could help to alleviate the higher PM2.5 and formaldehyde pollution in the study area. PM2.5 and formaldehyde both contribute to respiratory illness and aggravated asthma. The study area currently has an asthma rate of 10.59% which is higher than St. Paul's overall asthma rate of 9.0%. Children are at a higher risk for being affected by these pollutants because typically they are more active than adults, and inhale higher amounts of particulates. According to Rebecca Place, Program Coordinator at the Minnesota Pollution Control Agency, neighborhoods within 300 meters of a highway experience most of the negative impacts. After 300 meters, most of the air pollution concentration drops precipitously. Increased human activity on the land bridge could increase the concentration of pollutants being inhaled by residents.[42] This could negatively impact the health of those who use it. This provide further incentives to plant a diversity of trees with broad canopy coverage to mitigate the amount of pollution being inhaled on the land bridge.

[39] "Community Air Monitoring Project Summary Report - Thomas Dale Neighborhood" (Minnesota Pollution Control Agency, September 2014), https://www.pca.state.mn.us/sites/default/files/aq8-27b.pdf.
[40] "Health Effects of Particulate Matter" (World Health Organization, 2013).
[41] "Health Effects of Particulate Matter."
[42] Jason G. Su et al., "Does Exposure to Air Pollution in Urban Parks Have Socioeconomic, Racial or Ethnic Gradients?," *Environmental Research* 111, no. 3 (April 1, 2011): 319–28, https://doi.org/10.1016/j.envres.2011.01.002.

In the study area, the educational attainment of the population age 25+ is lower than St. Paul's (Figure 10). 22.2% of the the study area's population has less than a high school degree, and only 15.9% has a bachelor's degree. This is significant when compared to St. Paul where 23% of the population has a bachelor's degree. Green space has been associated with increased self-discipline in children, and especially for young girls. The land bridge could help to improve the educational attainment of the study area population.

Educational Attainment of Age 25+ Population	Rondo	St. Paul
Less than high school	22.2%	13.5%
High school diploma or GED	24.4%	21.2%
Some college or associate's degree	28.8%	26.1%
Bachelor's degree	15.9%	23.0%
Graduate or professional degree	8.7%	16.3%

Figure 10: Shows the educational attainment of population age 25+ in the study area.[43]

With the study area's percent of impervious surfaces it is important to actively plan for stormwater management in future construction. An increase in green space does not guarantee stormwater management improvement. If a green space is just a grass field, it provides little stormwater management capacity.[44] The study area has 11 percentage points more impervious surface coverage than St. Paul. By increasing stormwater management capacity through the construction of a land bridge mental health may be enhanced by reducing flooding and increasing natural vegetation.

What does the evidence say about how the decision will impact health through pathways?					
Green space health determinant	Positive or negative effect of decision	Likelihood of impact	How strong is the health impact? (severity)	Who will be impacted? (distribution)	Strength of evidence supporting impact on health
Mental health	+	Likely	Moderate	Those closest/users	Strong
Asthma	+	Low	Moderate	Those closest	Strong
Cancer	+	Low	High	Those closest	Moderate
Injuries	+/-	Uncertain	Moderate	Those closest/users	High

Legend:
Direction: positive (+), negative (-), mixed (+/-),
Likelihood: very likely, likely, possible, unlikely, uncertain
Magnitude: low, moderate, high
Severity: low (transient/minimal health symptoms), moderate (chronic/more severe transient health symptoms), high (severe chronic symptoms or death)
Distribution: population most likely to be affected by the changes due to green space change
Strength of Evidence: very strong (high quality evidence base), strong (strong evidence base, some conflicting evidence, generally supporting the pathway), fair (moderate strength/quality evidence base with conflicting evidence but majority supports pathway), weak (little evidence that is of moderate or weak quality), none (no evidence).

Figure 11: Green space health impact matrix

Key Findings and Recommendations

- Design the green space with the community, specifically youth and elders, to ensure its future utilization. If the green space is not designed for the community, it is less likely

[43] "Minneapolis-St. Paul Custom Profile," Minnesota Compass, accessed December 4, 2017, http://www.mncompass.org/profiles/custom/minneapolis-St.-paul.
[44] "Impervious Vs. Pervious Surfaces," n.d.

they will benefit from the mental health benefits green space can provide. This includes providing the desired trails, sports amenities, and maintenance. If the area is not designed for the community, it may fall into disrepair increasing crime that occurs within it, and feelings of stress and fear from the residents.

- The design of the green space should include key components of Crime Prevention through Environmental Design (CPTED). CPTED is the design, maintenance, and use of the built environment in order to enhance quality of life and reduce the incidence and fear of crime.[45] The CPTED theory involves: natural surveillance, territoriality, and access control. Natural surveillance is designing so users can easily observe their surroundings. Territoriality provides a clear designation between public, private, and semi-private areas, while making it easy for users to engage in an area's intended use. Access control is directed at decreasing criminal accessibility, such as having a visible entry way all users must enter.[46]
- We recommend the community create a local nonprofit focused on programming on the land bridge, specifically youth programing. As one health official put it, "Youth need to be kept busy and use a space to sponsor pride in it. A nonprofit focused on providing this service can help to decrease future crime and vandalism that could occur."
- The Rondo neighborhood has a thriving urban agriculture scene. To promote use and ownership a portion of the land bridge should be dedicated to urban agriculture. Nearby schools can use a plot to teach students about agriculture and gardening. Urban agriculture will encourage the use of the land bridge by Rondo residents, increasing the likelihood of its potential positive effects. For the garden to succeed we recommend: the city provide water hookup, and a garden manager is employed.
- To help promote a sense of pride and ownership within the residents the land bridge should include public art commemorating the history of the Rondo neighborhood. The public art should also be used as a teaching tool for visitors and current residents.
- Increase street cleaning on streets that experience an increase in boulevard trees. Boulevard trees provide a number of benefits, but also contribute debris that can contaminate and clog the storm sewer, causing an increase in flooding problems and negative effects downstream.
- When planting trees on the land bridge plant a diverse range of species that support an increase in canopy coverage. A diverse planting ensures that if a new disease or pest is introduced into the population the whole canopy will not be destroyed. Also, planting trees of low allergnicity may help to prevent asthma attacks and other health issues related to pollen.
- To limit further runoff and parking problems, we recommend making areas around the new green space permit parking only. This will encourage use of public transit to the space, and more walking around Rondo's main street encouraging spending within the neighborhood.
- MnDOT should work actively with the Capitol Region Watershed to incorporate stormwater BMP's into the land bridge design to increase the neighborhood's overall stormwater capacity.

[45] "Crime Prevention Through Environmental Design" (City of Portland Oregon, Spring 2015), https://www.portlandoregon.gov/oni/article/320548.
[46] "Crime Prevention Through Environmental Design."

- To contain vehicle emissions and pollution, MnDOT should explore new technology that cleans the emissions in the tunnel. The United Kingdom (U.K.) is currently exploring using tunnels to contain and treat the pollution. MnDOT can follow the example of the U.K. employing the new technology and set a precedent in the United States. The tunnel would be lined with pollution-absorbing polymer tiles, and have a mineral polymer barrier to reduce noise and pollution.[47]

Physical Activity Access

Pathway diagram

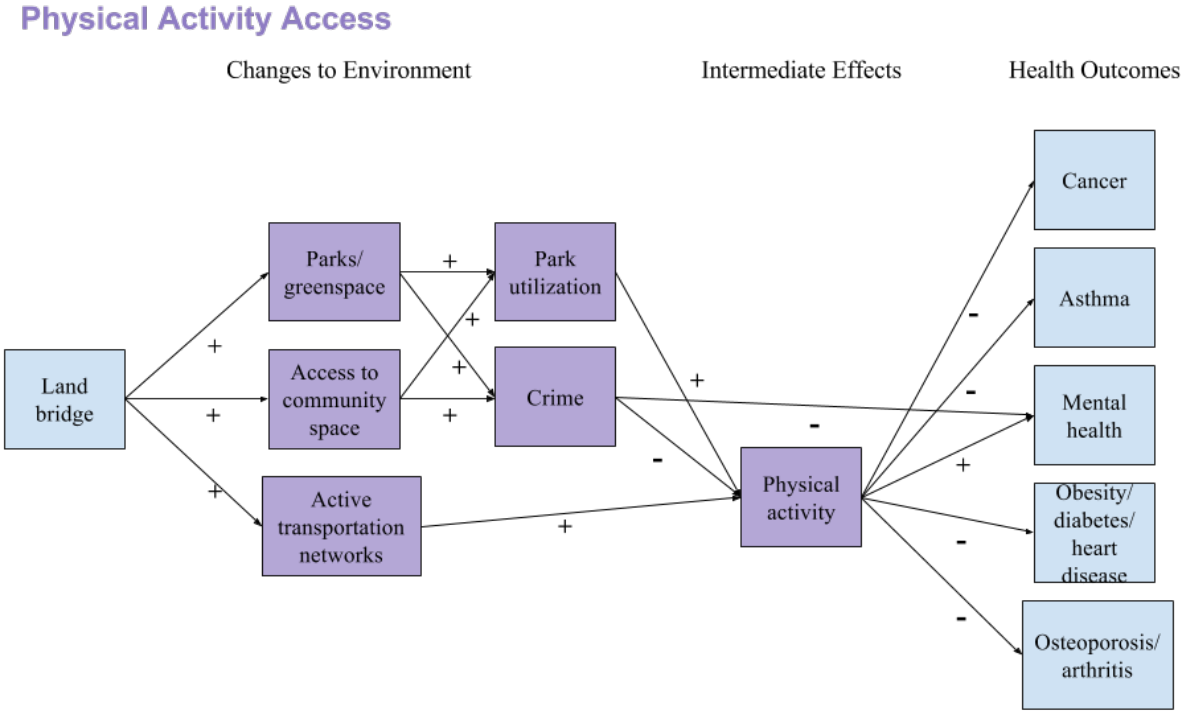

Figure 12: Physical activity access health pathway

Physical activity can be both purposeful and incidental. The term conjures up the image of people working out rigorously at the gym, or going for a long run. But physical activity can also happen when people walk to the grocery store to do their errands, or weed their gardens. Any activity that moves the body, either rigorously or gently, is a physical activity. Physical activity at all levels of intensity has positive impacts on health. But people's ability to be physically active can be dictated by their neighborhood. The easier it is to walk to destinations, the more people may choose that active form of transportation. And the more community garden space is available, the more residents will be physically active in that space. But if a neighborhood is not walkable, and does not provide other places for people to be active, physical activity levels may be low. Figure 12 shows the pathway from increased access to physical activity opportunities after the construction of the land bridge to subsequent possible health outcomes.

[47] Graeme Paton, "Pollution Tunnels to Tackle Car Emissions," *The Times*, August 3, 2017, https://www.thetimes.co.uk/article/pollution-tunnels-to-tackle-car-emissions-cjgpx3zmg.

Baseline of physical activity access in Rondo

Physical activity in Rondo can be described by looking at census data, Ramsey County data, and examining residents' ability to access physical activity opportunities. The census reports data on commute mode, which can provide a picture of how dependent residents are on cars to reach their jobs. The more car-dependent a neighborhood is, the less residents will be engaging in incidental physical activity. Other modes of transportation like biking, walking, or even taking public transit, require higher levels of physical activity.[48]

The American Community Survey Estimates, 2011-2015 show that 13.7% of residents of the study area use public transit to get to work, while 11.8% of residents of the study area walk, bike or work from home (Figure 13). These rates are somewhat higher than St. Paul's rates, indicating that study area residents may be more dependent on alternative forms of transportation.[49]

	Study Area	St. Paul
Public Transportation	13.7%	8.5%
Walk, bike, work from home, other	11.8%	11.7%

Figure 13: Commute modes for residents of the study area[50]

Ramsey County collects data on healthy lifestyle and behaviors in St. Paul. While this data is not specific to the study area, it is illustrative of what rates of physical activity are broadly typical for St. Paul residents. Seventy-nine percent of St. Paul residents reported that in the last 30 days, they participated in any physical activity or exercises such as running, calisthenics, golf, gardening, or walking for exercise.[51] Ramsey County also collects data on just how much physical activity residents are getting. Figure 14 shows how St. Paul residents' levels of physical activity compare to Ramsey County's as a whole.

	Inactive (0-9 minutes/week)	Insufficiently active (10-149 minutes/week)	Sufficiently active (150-299 minutes/week)	Highly active (≥300 minutes/week)
St. Paul	5.5%	34.7%	23.5%	36.3%
Ramsey County	4.6%	35.7%	25.7%	34.0%

Figure 14: Physical activity level for St. Paul residents[52]

The World Health Organization recommends that adults should get in at least 150 minutes of moderate aerobic activity each week.[53] This activity can come in many forms, both purposeful and passive. Physical activity levels may be increased with increased access to physical activity

[48] Lawrence D. Frank, Martin A. Andresen, and Thomas L. Schmid, "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars," *American Journal of Preventive Medicine* 27, no. 2 (2004): 87–96.
[49] "Minneapolis-St. Paul Custom Profile."
[50] "Minneapolis-St. Paul Custom Profile."
[51] "Metro SHAPE Adult Health Survey 2014: Ramsey County Data Book" (Metro SHAPE, 2014), https://www.ramseycounty.us/sites/default/files/Open%20Government/Public%20Health%20Data/ramsey_county_metro_SHAPE_2014_survey.pdf.
[52] "Metro SHAPE Adult Health Survey 2014: Ramsey County Data Book."
[53] "WHO | Physical Activity and Adults," WHO, accessed December 4, 2017, http://www.who.int/dietphysicalactivity/factsheet_adults/en/.

opportunities. Parks, recreation centers, and gyms all provide the opportunity for residents to engage in purposeful physical activity. The study area currently has several such spaces, including Carty Park, the Martin Luther King Recreation Center, Webster Park, Central Village Park, and a YWCA.

Bike routes are another piece of infrastructure that work to encourage physical activity by providing bike lanes that separate people from cars and increase feelings of safety while biking on city, county, and state owned streets. The St. Paul Bicycle Plan currently shows that there is a bicycle boulevard running through the project area on Charles Avenue. There is no other official bike infrastructure on the city streets in the study area area.

The national Safe Routes to Schools program works to ensure that students can easily and safely walk and bike to school. This program helps youth to engage in physical activity as part of their daily transportation to and from school. In the study area, planning for Maxfield Elementary School and Capitol Hill/Rondo Magnet School to be part of the Safe Routes to Schools program began in 2017.[54]

Physical activity access and health

The physical structure of a neighborhood can influence the health of its residents. The environment that someone lives in is one of the social determinants of health (Figure 15). The social determinants of health, in addition to more traditional measures like quality of health care and genetics can impact an individual's health outcomes. Environment matters because it affects how easy it is for someone to access goods and services including things like food, daycare, employment, or medical care. Neighborhoods can promote physical activity by ensuring that these goods and services are located within walking distance from residential areas. A neighborhood with a mix of uses accessible by foot or bike has healthier residents.

[54] "Safe Routes to School," St. Paul, Minnesota, May 9, 2017, https://www.stpaul.gov/departments/public-works/walking-St.-paul/safe-routes-school.

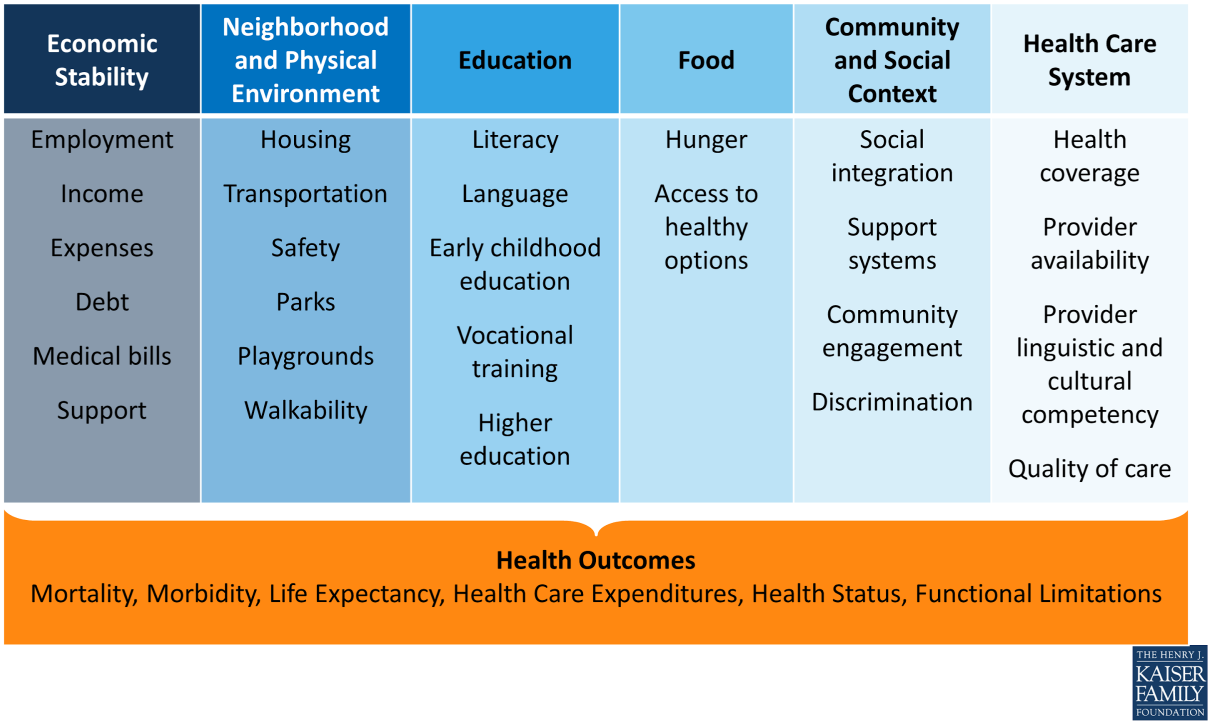

Figure 15: The social determinants of health[55]

Specifically, a mixed-use neighborhood can help prevent obesity. The more mixed a neighborhood in terms of its uses, the less likely its residents will be obese, regardless of gender or ethnicity.[56] The same study that identified the association between land-use mix and obesity also showed that for each additional hour that a person spends in a car per day, their likelihood of being obese increases by six percent. Accordingly, each addition kilometer a person walks per day decreases their likelihood of being obese by 4.8 percent.[57] The form of an urban neighborhood can have a lot to do with the health of its residents.

While urban form can determine if and where people will walk for transportation, the presence of bike infrastructure can have a positive impact on if and where people will chose to bike for transportation. Biking is another form of active transportation that becomes more feasible the more the physical environment is designed for it. Bike infrastructure can take the form of bike lanes that are simply painted on the street, bike lanes that are protected from traffic by a barrier of some sort, or bike trails that do not share the street with cars, but are more isolated from other forms of traffic, thereby decreasing conflict between transportation modes.

The safer people feel while biking, the more likely they are to bike. In fact, as cities build more bike lanes, the number of cyclists increases as the sense of "safety in numbers" grows. The

[55] Nov 04, 2015 | Harry J. Heiman, and Samantha Artiga, "Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity," *The Henry J. Kaiser Family Foundation* (blog), November 4, 2015, https://www.kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/.
[56] Frank, Andresen, and Schmid, "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars."
[57] Frank, Andresen, and Schmid.

majority of city residents identify as being "interested but concerned" about biking. Creating bicycle infrastructure that alleviates some of their safety concern can increase cycling rates.[58]

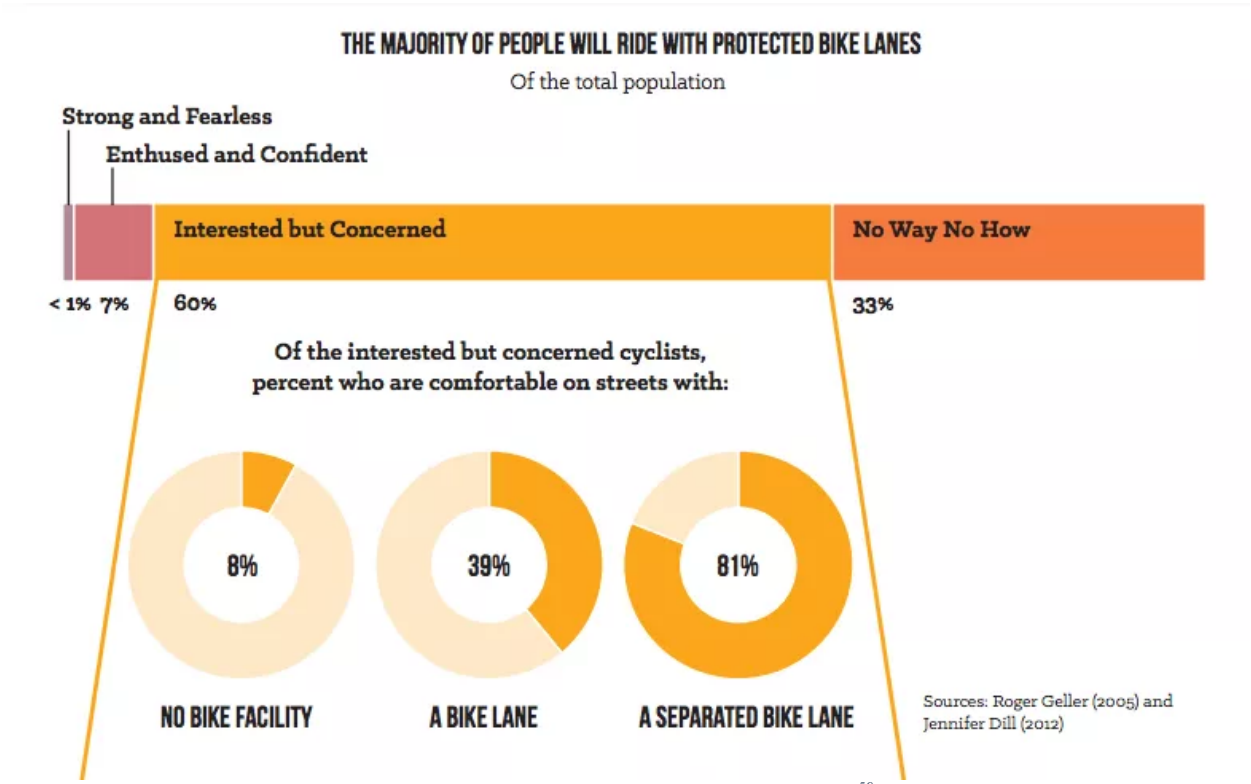

Figure 16: Bikers' level of comfort changes with the type of bike infrastructure available[59]

Physical activity, including both walking and biking, can have positive effects on both physical and mental health. Physical activity is scientifically proven to reduce mental stress and depression, ward off osteoporosis, and improve cardiovascular health.[60] Physical activity is a building block of personal health, necessary for chronic disease prevention and the promotion of more general well being.

Impact assessment: physical activity and the land bridge

Based on community feedback and accumulated research, it is reasonable to assume that increased access to physical activity opportunities will increase residents' levels of physical activity and increase the related health benefits.

[58] "Equitable Bike Share Means Building Better Places for People to Ride" (National Association of City Transportation Officials, July 2016), http://usa.streetsblog.org/wp-content/uploads/sites/5/2016/07/NACTO_Equitable-Bike-Share-Means-Building-Better-Places-To-Ride.pdf.

[59] "New Study Confirms That Protected Bike Lanes Get More People on Bikes and Reduce Injuries," TreeHugger, accessed December 15, 2017, https://www.treehugger.com/bikes/new-study-confirms-protected-bike-lanes-get-more-people-bikes-and-reduce-injuries.html.

[60] M. S. Sothern et al., "The Health Benefits of Physical Activity in Children and Adolescents: Implications for Chronic Disease Prevention," *European Journal of Pediatrics* 158, no. 4 (1999): 271–74.

In a paper investigating the ways in which to most effectively promote health-protective physical activity, James Sallis said, "There is a growing consensus that large changes in population levels of physical activity and other behaviors required to improve cardiovascular health will require major modifications in environments and policies."[61] The proposed land bridge in Rondo is an example of a large landscape change.. If designed correctly, the land bridge could significantly alter the physical environment of the neighborhood, creating more opportunities for residents to engage in physical activity.

But beyond his general call for large environmental changes, Sallis also noted, "It is becoming clear that racial/ethnic minority and low-income communities are disadvantaged in access to recreation facilities, positive aesthetics, and protection from traffic."[62] The construction of a land bridge could help to address this systemic disadvantage by providing the study area with greater access to recreation facilities, an aesthetically pleasing infrastructure project, and greater opportunities for safe travel on foot and bike, isolated from automobile traffic. Each of these changes would help to promote active transportation and greater physical activity among study area residents, thereby increasing their health.

What does the evidence say about how the decision will impact health through pathways?					
Physical activity health determinant	Positive or negative effect of decision	Likelihood of impact	How strong is the health impact? (severity)	Who will be impacted? (distribution)	Strength of evidence supporting impact on health
Mental health	+	Possible	Moderate	Users	Strong
Asthma	+	Low	Moderate	Those closest	Moderate
Cancer	+	Low	Moderate	Those closest	Moderate
Obesity	+	Very likely	High	Those closest/users	High

Legend:
Direction: positive (+), negative (-), mixed (+/-),
Likelihood: very likely, likely, possible, unlikely, uncertain
Magnitude: low, moderate, high
Severity: low (transient/minimal health symptoms), moderate (chronic/more severe transient health symptoms), high (severe chronic symptoms or death)
Distribution: population most likely to be affected by the changes due to physical activity change
Strength of Evidence: very strong (high quality evidence base), strong (strong evidence base, some conflicting evidence, generally supporting the pathway), fair (moderate strength/quality evidence base with conflicting evidence but majority supports pathway), weak (little evidence that is of moderate or weak quality), none (no evidence).

Figure 17: Physical activity access health impact matrix

Recommendations

- The land bridge should include programming designed to increase neighborhood physical activity such as, sports fields, playground equipment, stationary exercise equipment, walking trails, and seating. This programming should be designed in consultation with current community members to determine the programming most appealing and compelling to residents.
- The land bridge should increase pedestrian connections across the freeway, making it easier and safer for residents to walk from destinations on one side of the freeway to

[61] James F. Sallis et al., "Role of Built Environments in Physical Activity, Obesity, and Cardiovascular Disease," *Circulation* 125, no. 5 (2012): 729–37.
[62] Sallis et al.

destinations on the other side. Pedestrian traffic should be prioritized in the overall design of the project by creating spaces for people to walk that are sheltered from traffic, aesthetically pleasing, and direct.

- The Rondo neighborhood should be integrated into the St. Paul Bicycle Plan. Any bike infrastructure implemented in the neighborhood should focus on user safety. Protected bike lanes and separated cycletracks are the preferred form of bike infrastructure.
- Land use in Rondo should be dense and mixed-use. Neighborhood goods and services should be located in walkable locations, at intervals that allow the majority of residents to walk or bike to reach them.

Local Economy

Pathway Diagram

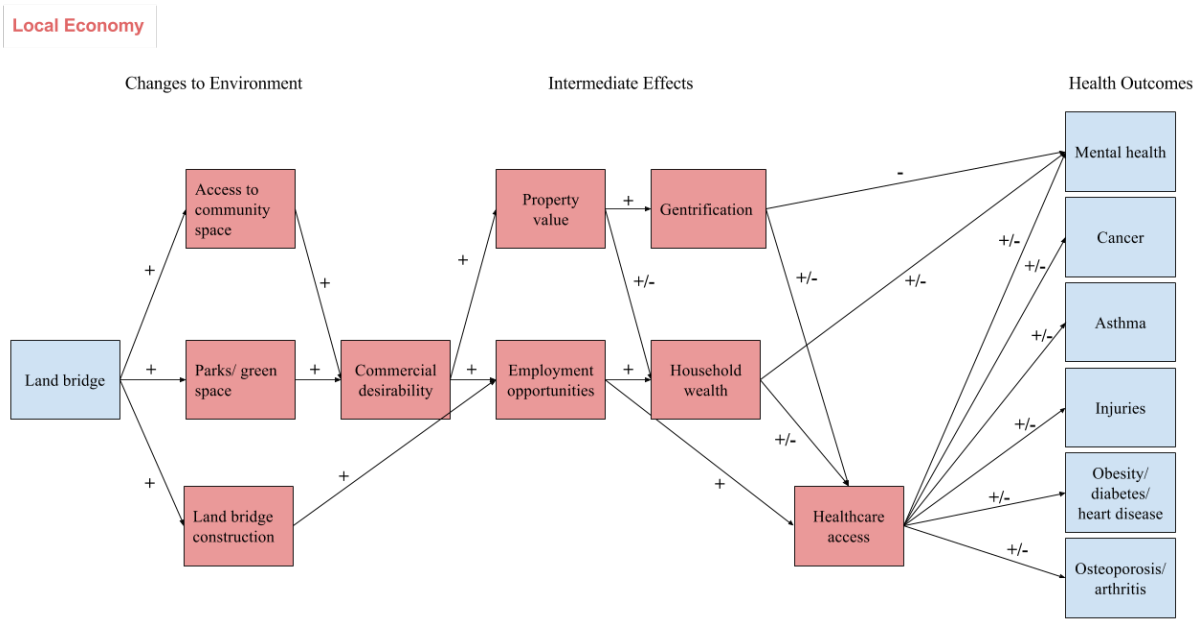

Figure 18: Local Economy event pathway

The local economy event pathway (Figure 11), has significant overlap with both green space and physical activity pathways. Initially, the construction of a land bridge is likely to affect the neighborhood in three physical ways: increasing available green space, increasing available community space, and changing the landscape in neighborhoods immediately adjacent to the land bridge through the construction process. The first two changes, an increase community space and increase in green space, could lead to an increase in desirability for the neighborhood which could contribute to rising property values, property investment opportunities, the opening of new businesses, the decreasing of vacant lots, and an increase in nearby employment opportunities. The construction of the land bridge could also contribute directly and indirectly to employment opportunities and increased business traffic in the neighborhood. Multiple studies have found strong corrolations between unemployment and negative health outcomes in a wide range of populations.[63] An increase in employment opportunities would thus have positive

[63] R L Jin, C P Shah, and T J Svoboda, "The Impact of Unemployment on Health: A Review of the Evidence.," *CMAJ: Canadian Medical Association Journal* 153, no. 5 (September 1, 1995): 529–40.

benefits on health outcomes for residents, as healthcare access could be improved through rising incomes and increased living stability.

Rising property values, however, could lead to higher costs of living for many residents. Living costs could rise enough to force residents to move to more affordable parts of the region as they are displaced from their homes. One study in Barcelona, Spain, found that improving green space did in fact cause the "redistribution of vulnerable populations" which lead to negative health outcomes for these populations who were no longer able to access the green space originally built in their benefit.[64] If not done carefully, the implementation of neighborhood amenities could decrease health outcomes and healthcare access. These predictions are discussed further in the following sections.

Baseline of the local economy in Rondo

Residents in the study area work primarily in four major fields: Management, business, science, and arts occupations; Service occupations; Sales and office occupations; and Production, transportation, and material moving occupations.[65] Within those fields, the types of occupations that the largest proportions of study area residents hold are office and administrative support occupations (14% of residents); and education, legal, community service, arts, and media occupations (12% of residents). The rest of study area residents (74%) are employed in many different fields at lower proportions (Figure 12). About a third of the residents in this community work within the city, while the other two thirds commute outside the city for work.

[64] Helen Cole et al., "A Longitudinal and Spatial Analysis Assessing Green Gentrification in Historically Disenfranchised Neighborhoods of Barcelona: Implications for Health Equity," *Journal of Transport & Health* 5, no. Supplement (June 1, 2017): S44, https://doi.org/10.1016/j.jth.2017.05.333.

[65] U. S. Census Bureau, "American FactFinder." https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Occupation of Rondo residents	Tract 324	Tract 325	Tract 326	Tract 327	Tract 335	Tract 336	Tract 337	Tract 338	Tract 339	Tract 340	Total	Total %
Management, business, science, and arts occupations:	347	416	408	197	495	86	87	359	361	596	3352	31%
Education, legal, community service, arts, and media occupations:	82	104	205	60	248	51	33	162	122	288	1355	12%
Management, business, and financial occupations:	161	161	88	43	117	14	30	113	131	197	1055	10%
Management occupations	129	66	58	0	80	14	18	75	91	135	666	6%
Service occupations:	295	342	437	292	255	206	178	306	174	162	2647	24%
Food preparation and serving related occupations	80	170	113	172	131	8	45	110	44	31	904	8%
Personal care and service occupations	101	83	186	17	51	79	66	85	73	16	757	7%
Sales and office occupations:	299	456	334	284	350	42	73	262	220	127	2447	22%
Office and administrative support occupations	244	326	179	198	205	6	47	163	106	81	1555	14%
Sales and related occupations	55	130	155	86	145	36	26	99	114	46	892	8%
Production, transportation, and material moving occupations:	352	278	327	104	417	82	85	64	96	141	1946	18%
Production occupations	192	166	236	50	292	21	31	21	46	72	1127	10%
Transportation occupations	139	57	37	13	112	33	16	23	14	50	494	5%

Source: 2011-2015 American Community Survey. US Census. https://www.census.gov

Figure 19: Top occupation types and employment fields for Rondo residents (2015).

The study area has a higher proportion of foreign-born residents and of residents of color than the city as a whole (Figure 13). In the census tracts within this study area almost three quarters of the residents are people of color and over a quarter of residents are foreign-born. In St. Paul as a whole, less than half of the population are people of color and less than a fifth are foreign-born. The study area also has a significantly lower median income than the median income in St. Paul as a whole, by over ten thousand dollars. Census tracts in the study area had a median income is just over $37,000, while the median income in St. Paul is just under $48,000.[66]

[66] "Minnesota Compass Custom Profile: Census Tracts in Rondo."

	Study Area	St. Paul
White Alone, not Hispanic or Latino	26%	54%
Of Color	74%	46%
Black or African American	36%	15%
American Indian or Alaskan Native	2%	<1%
Asian or Pacific Islander	24%	17%
Other Race	<1%	<1%
Two or More Races	5%	3%
Hispanic or Latino total	7%	6%
Foreign Born	28%	11%

Figure 20: Racial makeup and foreign born population in Rondo,[67]

One third of residents in the study area are in poverty, compared to under a quarter of St. Paul as a whole (Figure 14). The unemployment rate in this area is higher, at 13%, than the rest of St. Paul, at 9%. For reference, the Twin Cities region has a slightly lower unemployment rate, at 6%. Three quarters of the residents in this area do not hold bachelor's or other higher education degrees, which is a high proportion compared to the two thirds of St. Paul residents who do not hold degrees. The study area also has a large proportion of residents who lack high school degrees compared to the city as a whole. Over a fifth of study area residents did not graduate high school, compared to under 10 percent of all St. Paul residents (Figure 14).[68]

	Study Area	St. Paul
Unemployment	13%	9%
Less than high school	22%	12%

Figure 21: Employment and educational attainment in Rondo[69]

Currently, much of the study area is zoned as residential, with varying levels of density. There are zoning provisions for businesses along Selby Avenue on the southern edge of the study area, and along Dale Street in the north-central part of the study area. At the northern edge of the study area, along the railroad tracks, land is zoned almost exclusively for industrial uses.[70] It is unclear how the zoning of this neighborhood may change with the upcoming comprehensive plan finalization, so the specific impact of the land bridge on changes in land use is still open to discussion. Most likely, the land bridge will be a valuable asset that could draw more businesses and developments to the area in a similar way that has been seen by the Central Corridor development.[71] Development of a land bridge, along with current planning trends, will likely push future zoning in this study area towards mixed use, higher density developments, especially along the commercial corridors mentioned above. This could improve livability for current residents, as mixed use zoning culd allow for improved walkability, space for locally-owned

[67] "Minnesota Compass Custom Profile: Census Tracts in Rondo."
[68] "Minnesota Compass Custom Profile: Census Tracts in Rondo."
[69] "Minnesota Compass Custom Profile: Census Tracts in Rondo."
[70] "Maps," St. Paul, Minnesota, October 19, 2015, https://www.stpaul.gov/departments/planning-economic-development/maps-and-data/maps.
[71] "Healthy Corridor for All: A Community Health Impact Assessment of Transit-Oriented Development Policy in St. Paul, Minnesota | PolicyLink," accessed December 4, 2017, https://www.policylink.org/find-resources/library/healthy-corridor-for-all.

businesses, more afforable housing units, and more community spaces. When paired with inclusionary zoning, mixed use developments can provide even more affordable housing and business options.[72]

Impact Assessment: local economy and the land bridge

Looking at a study for a similar infrastructure project can be helpful to understanding communities like Rondo. The Healthy Corridors for All (HCFA) research looked at the rezoning of the central corridor (CC) for the Green Line light rail project. The CC lies mostly along University Ave and a significant portion of it overlaps with the study area. This study concluded that the zoning change associated with the project would lead to an increase in the overall number of jobs along the CC. The research team also found, however, that most of the jobs would increase the mismatch between local skill sets and local employment opportunities. For example, manufacturing jobs, which generally require basic education attainment levels, were expected to decrease as a result of rezoning for the infrastructure project. In the census tracts included in this study, the proportion of residents who do not hold advanced degrees make up about half the population.[73] So, while the number of total jobs was expected to grow as a result of the Green Line construction project, the number of jobs projected to serve local residents may not have been sufficient to "lift corridor families out of poverty", to support households in finding resources to remain in their community for the long term, and therefore to improve health outcomes for existing residents.[74] These changes could have a negative impact on health outcomes, specifically stress and mental health (which often impacts physical health as well).

Changes in the built environment, like large infrastructure projects or transportation project, can positively impact the desirability and land values of nearby neighborhoods. An increase in desirability and in property value is often a positive change for homeowners or other property owners as the value of their investment will increase. Neighborhood desirability is a balancing act however, as property tax rates tend to increase which can translate to foreclosures and evictions for renters as well as for those owners who cannot keep up with rapid increases in the cost of living. Because almost two thirds of units in the study area are rental units, a large increase in desirability and thus rent prices can have a devastating impact on residents who rent their homes.[75] The same is true for business owners who lease their business space. As the neighborhood becomes increasingly desirable, new residents and businesses will move in while many long-term residents and businesses find themselves increasingly unable to afford to stay. Occurrences like this are called gentrification, which can involve "changing the essential character and flavor" or displacing lower-income residents of a neighborhood as more affluent residents move in.[76]

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[72] Michael Seasons, "Does Mixed-Use Development Benefit Everyone? Housing Affordability in a Changing Labour Market," April 25, 2014, https://uwspace.uwaterloo.ca/handle/10012/8358.
[73] "Minnesota Compass Custom Profile: Census Tracts in Rondo."
[74] "Healthy Corridor for All: A Community Health Impact Assessment of Transit-Oriented Development Policy in St. Paul, Minnesota | PolicyLink."
[75] "Minnesota Compass Custom Profile: Census Tracts in Rondo."
[76] Maureen Kennedy and Paul Leonard, "Dealing with Neighborhood Change: A Primer on Gentrification and Policy Choices," *Brookings* (blog), November 30, 2001, https://www.brookings.edu/research/dealing-with-neighborhood-change-a-primer-on-gentrification-and-policy-choices/.

The conclusions that one could draw from the HCFA study is that a large infrastructure improvement project, like the land bridge, will ultimately lead to changes in land use, community needs, and household health outcomes. Considering the high percentage of renters, the education attainment levels of residents, and the need for stable jobs that do not require advanced degrees the land bridge could have significant negative impacts on the community. Some recommendations that the researchers proposed for the CC include protecting existing manufacturing and service jobs (as well as youth internship and job programs), employing local residents in construction jobs related to the new infrastructure, and encouraging more retail space for new mixed use buildings.

What does the evidence say about how the decision will impact health through pathways?					
Local economy health determinant	Positive or negative effect of decision	Likelihood of impact	How strong is the health impact? (severity)	Who will be impacted? (distribution)	Strength of evidence supporting impact on health
Mental health	+/-	Possible	High	Those closest	Fair
Chronic diseases	+/-	Possible	High	Those closest	Fair

Legend:
Direction: positive (+), negative (-), mixed (+/-),
Likelihood: very likely, likely, possible, unlikely, uncertain
Magnitude: low, moderate, high
Severity: low (transient/minimal health symptoms), moderate (chronic/more severe transient health symptoms), high (severe chronic symptoms or death)
Distribution: population most likely to be affected by the changes due to local economy change
Strength of Evidence: very strong (high quality evidence base), strong (strong evidence base, some conflicting evidence, generally supporting the pathway), fair (moderate strength/quality evidence base with conflicting evidence but majority supports pathway), weak (little evidence that is of moderate or weak quality), none (no evidence).

Figure 22: Local economy health impact matrix

Recommendations

Rondo residents experienced significant trauma that affected multiple generations when they lost their thriving main street and invaluable community spaces with the construction of the I-94 highway in the 1960s. The proposed land bridge would be an important step in the healing process, both for the physical land and for Rondo residents. It is important, however, that the impact of a major infrastructure project like this one come with a set of instructions to reduce the impact of gentrification and displacement, while focusing on growing locally-relevant job opportunities. In one study from Portland, OR, author Lisa K. Bates point out that the "key distinction between revitalization and gentrification is the negative consequence of involuntary residential displacement".[77] The author goes on to outline five key tools to be utilized in the face of development projects, like that of the Rondo Land Bridge:

1. A broad community impacts policy that sets clear expectations about promoting positive community impacts and mitigating harms.
2. Community Impact Reports for major projects, especially for projects with public funding, to define the potential impacts, costs and benefits and identify possible mitigation programs.

[77] Lisa Bates, "Gentrification and Displacement Study: Implementing an Equitable Inclusive Development Strategy in the Context of Gentrification," *Urban Studies and Planning Faculty Publications and Presentations*, May 1, 2013, http://pdxscholar.library.pdx.edu/usp_fac/83.

3. Community Benefits Agreements, primarily for private projects, that create a negotiated agreement between developer and the surrounding community to create a less adversarial review process and provide specific benefits related to the development.
4. Inclusionary Zoning through which developers provide affordable units, or pay in lieu fees, to ensure affordable housing is part of new development.
5. Education and Technical Assistance through which the City could do more to promote best development practices for mixed income and affordable/workforce housing, similar to Portland's effort to promote green building.

There is little doubt that the proposed land bridge proposed will act as a social and environmental instrument of healing. It is vital, however, that planners make sufficient steps to ensure that residents for whom the bridge is to be built are the same residents who will be bemnefiting from the land bridge. Existing residents should be able to enjoy their new neighborhood amenity long into the future if they so choose. Considering Bates' strategies to reduce the negative impacts of gentrification and the historic taruma of the area, the most effective recommendations that the Rondo land bridge organizers and planners should consider are:

- A community benefits agreement (CBA) between developers, community members, MnDOT, and the City od St. Paul that focuses on inclusiveness and accountability throughout the negotiation and development processes, and prioritizes a "truly inclusive process and […] legally enforceable commitments".[78]
- Advocating at the city level to utilize inclusionary zoning and neighborhood planning tools to increase the amount and diversity of affordable housing types in the neighborhood.
- Expanding support for local businesses and entrepreneurs through existing City funding streams, like the Vendor Outreach Program at the City of St. Paul[79], and through non-profit business support organizations like Northside Economic Opportunity Network (NEON) in Minneapolis.
- Continue to reserve legitimate, decision-making participation opportunities for community members, and continue to be concientious of historical community traumas, community needs, and community deisres.

REFLECTION

When we decided to join RCR on this project, we knew it would be a beneficial learning experience, and an opportunity to work with community leaders. The Rondo community is part of our larger Twin Cities community, so it was an honor to take this task on in order to give something useful back to our neighbors in Rondo. Meeting community members in the first few weeks of the project reminded us of the weight of historical injustice that this community has been forced to live through. It was sobering to know that some community members present at our meetings had experienced the destruction of homes and businesses during the construction of

[78] Julian Gross, "Community Benefits Agreements: Definitions, Values, and Legal Enforceability," *Journal of Affordable Housing & Community Development Law*, 2007, 35–58.
[79] "Contract Compliance & Business Development," St. Paul, Minnesota, October 19, 2015, https://www.stpaul.gov/departments/human-rights-equal-economic-opportunity/contract-compliance-business-development.

I-94. Our presence as University of Minnesota students added tension to the room because we were coming in as representatives of an institution that has historically been involved in studies and projects that perpetuate injustice. Being with community members that could speak to the sensitivity of government projects and institutions within their community drove home the message that our contribution to this HIA would need to be exceptionally thoughtful and reflective of the narratives shared by community members.

Unlike other capstone projects, which usually involve interaction with one or two stakeholders, our capstone project must take in and absorb the interests of affected residents, of institutions, and of technical experts. We must incorporate these narratives into our writings and research while producing a very structured, formal report that fits within the norms of academic institutions and is not necessarily focused on lifting up community stories. This dichotomy, between institutions and community experiences, is not new. During highway construction projects across the US, many communities were destroyed for the progress touted by institutions and investors, while resident voices were sidelined.

For these reasons, we are very excited to see this portion of the HIA implemented into the community's proposals for development of the land bridge. We are also grateful to be a part of such a unique experience that focused so much on relationships and dialogue, while navigating between institutional timelines and community timelines. We hope that we have produced something useful for both the RCR team, and for the residents of this diverse, strong, and evolving neighborhood.

CONCLUSION

The analysis completed in this report will be included in the final HIA within the assessment section. RCR will provide an introduction to the full report, the historical narrative of the Rondo community, a chapter dealing specifically with gentrification, the challenges and opportunities of the project, redevelopment options, and final recommendations. When the MnDOT I-94 Study is completed, the final HIA will be included as an appendix. The HIA document will give the proposed land bridge more political clout, and increase the likelihood of MnDOT garnering federal funding for the project. Ideally, the HIA will help bring a solid community voice to the development of the land bridge and ultimately help heal some of the trauma from the construction of I-94.

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