



Ganado/Burnside Area Traffic Circulation Study Health Impact Assessment

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**Arizona
Department of
Health Services**



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1. Summary

HEALTH IMPACT ASSESSMENT (HIA) PURPOSE AND GOALS

This project provides recommendations to improve community health associated with roadway improvements recommended in the Ganado/Burnside Area Traffic Circulation Study. The goal of this HIA is to increase the awareness of the chapter and Tribal transportation providers about the connection between transportation and community health.

AREA TRAFFIC CIRCULATION STUDY

The Area Traffic Circulation Study is being conducted by the Arizona Department of Transportation (ADOT) as part of its Planning Assistance to Rural Areas (PARA) program. The study area includes the area within one mile of SR 260 between Ganado and Burnside, and along SR 191 south of Ganado and North of Burnside, and along Indian Route 15 south of Burnside. Ganado and Burnside are located in Apache County, Arizona within the Navajo Nation.

HEALTH IMPACT ASSESSMENT

Funding for this Health Impact Assessment project was provided by the Centers for Disease Control and Prevention-National Center for Environmental Health under grant number 1UE1H001193-01. This Health Impact Assessment was executed through a partnership between the Arizona Department of Transportation (ADOT) Planning Assistance for Rural Areas (PARA) program, the Arizona Department of Health Services (ADHS), and the Ganado Chapter. This partnership was formed in recognition of the strong relationship between transportation and health (especially in rural areas with limited transportation options) in order to to leverage the health benefits of transportation investments.

Through this partnership:

- Demographic and other research and mapping conducted for the Area Traffic Circulation Study was used to develop the scoping and assessment portions of this HIA.
- Emergency call and local accident data obtained for the HIA was used in assessing circulation issues to be addressed by the Area Traffic Circulation Study.
- Public engagement activities for both the Area Traffic Circulation Study and this HIA were combined, to make efficient use of the time of community members and reduce additional trips.

- Survey data and stakeholder interview information conducted through this HIA was shared with the Area Traffic Circulation Study and contributed to the analysis of mobility issues within the Ganado and Burnside communities
- As recommendations for this HIA were being developed, they were shared with the Area Traffic Circulation Study consultants, and resulted in some modification of the study recommendations.

SUMMARY OF FINDINGS

Roadway improvements, pedestrian facilities and trails will improve safety and enhance mobility within and between Ganado and Burnside. Sidewalks, shoulders, lights, trails, and improvements to bus stops and the creation of shoulders within along SR264 between Ganado and Burnside and along US191 and Indian Routes within these communities will provide safe places to walk and engage in traditional activities such as running. These facilities will also enhance access to the Sage Memorial Hospital and other community institutions that contribute to social health. Community Institutions include the Ganado Chapter House, Senior Center, and Friday community market. More opportunities for walking within and between community destinations and to local transit (circulators) serving elders and others without access to vehicles who may not be able to walk longer distances results in more physical activity. Increasing the safety of existing transportation facilities for motorists, transit riders, school children and school busses, and providing safe places to walk results in reducing collisions between people and vehicles. Connecting people to social institutions and to one another results in less social isolation. A reduction in collisions between people and vehicles will result in fewer deaths and injuries. Increased physical activity can help to reduce the occurrence of chronic obesity related diseases such as diabetes, heart disease, and hypertension. It can also result in reduced elderly falls. Less social isolation can help to reduce depression and other types of mental illness that can result in chronic alcohol and substance abuse.

RECOMMENDATIONS

PROVIDE HEALTHY TRANSPORTATION OPTIONS TO REDUCE INJURIES AND OBESITY RELATED CHRONIC DISEASES AS FOLLOWS:

- Asphalt or concrete surfaces on all paths along SR264
- Marked pedestrian crosswalks and wireless solar pedestrian signs at Chapter House Road, the intersection of SR264 and US191, the School Entrance and at Indian Route 37 and SR264
- Marked pedestrian crosswalks with solar activated signals at local roads that intersect from the north with SR264
- Connect elders living at the Life Home to the community by increasing their access to transit by providing a local circulator stop with a bus shelter at the Life Home Access Road and Indian Route 9201. Provide a sidewalk along the access road so elders can safely walk to the circulator stop throughout the year.
- An enhanced and ADA accessible sidewalk between SR264 and the Chapter House as recommended in the Circulation Study. This HIA additionally recommends connecting this sidewalk to the Senior Center and the Chapter house
- A marked pedestrian crossing and solar activated signal at the south entrance to the school and the start of the Burnside Pedestrian Path on the east side of Indian Route 15

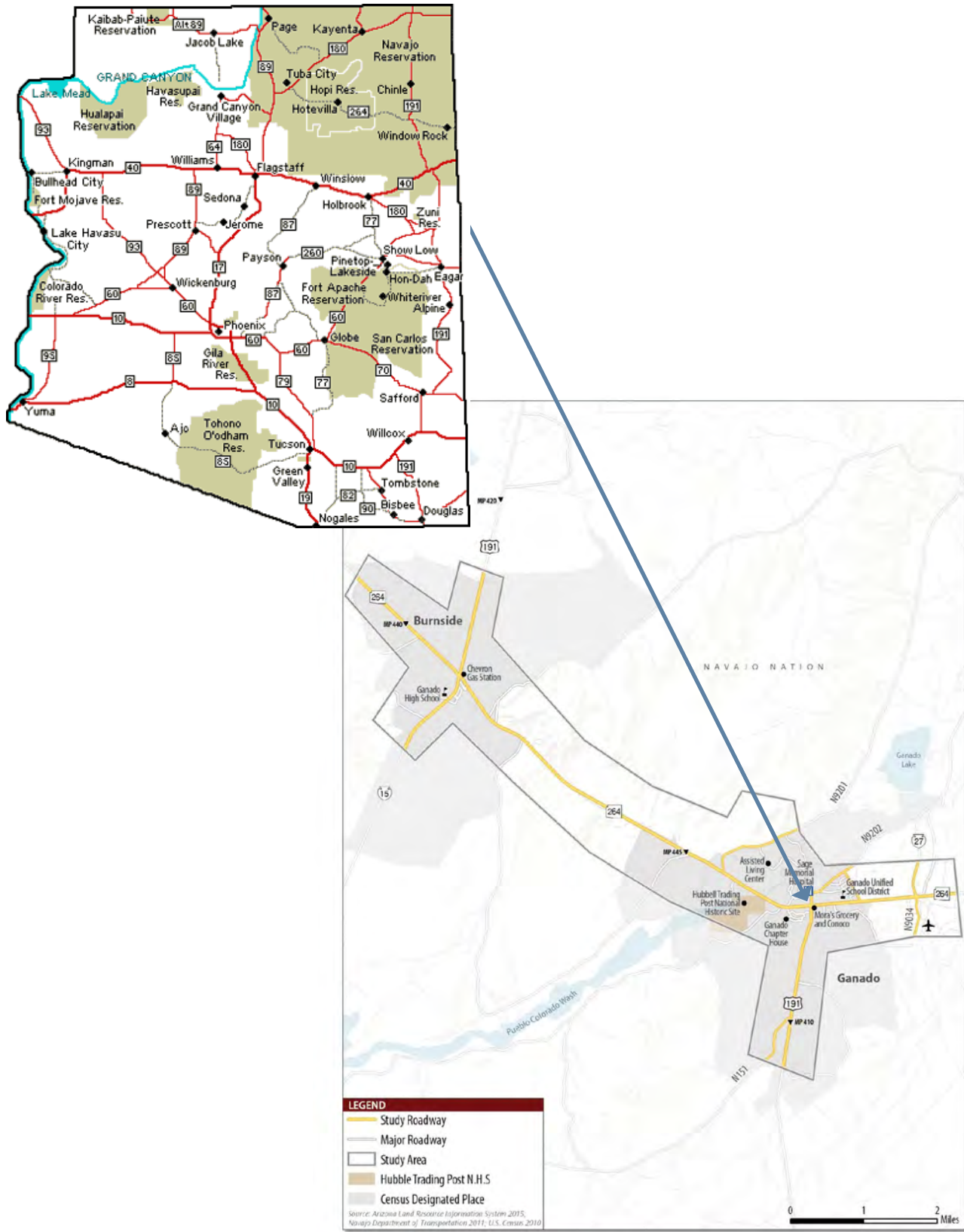
- Pedestrian crossings between the high school and the center and the McDonald's and the Center should be provided to reduce the potential for collisions between pedestrians and vehicles
- Street lighting between Chapter House Road and Indian Route 420, along US191 from Chapter House Road to SR264, and along Round Top/Trading Post Road and Indian Route 420 to its intersection with SR264 (as recommended in the Circulation Study)
- Solar activated bus stop warning signs at all bus stops on SR 264 and US 191 (as recommended in the Circulation Study)
- School speed zones and reduced speeds supported by combination of traffic control and enforcement measures that could include conventional police surveillance and traffic calming.
- Speed tables, speed feedback signs, vertical markers that narrowed travel lanes, and speed limit markings painted on the road on a red background on:
 - SR264:
 - Between Indian Route 420 and Chapter House Road
 - From the Burnside Traffic Circle:
 - East on SR264 past the Giant Convenience Store
 - On US191 from:
 - Chapter House Road to SR264
 - Indian Route 15 from the south entrance of the Ganado High School to 1 mile north of the Burnside Traffic Circle
- When SR264 is widened to four lanes, a four foot wide, paved with rumble strip and four foot wide, unpaved shoulder along both sides of SR264 (long term)
- Until SR264 is widened to four lanes, a paved pedestrian path on both sides of SR264 with a 15 foot wide buffer zone (as recommended in the Circulation Study)
- In all areas where lighting is recommended, separate pedestrian and roadway lighting fixtures, or lighting fixtures that are designed to illuminate the pedestrian and roadway areas
- A minimum three foot buffer and vertical curb separating the pedestrian and vehicular travel ways on Round Top/Trading Post Road and Indian Route 420 to the intersection with SR264
- A buffer with or vertical barrier such as street trees on SR264 between Chapter House Road and Indian Route 420

PROVIDE HEALTHY TRANSPORTATION OPTIONS TO REDUCE SOCIAL ISOLATION

Provide additional transit stops at:

- Chapter House Road and SR264
- The planned shopping center
- Enhance bus and circulator stops with shelters and lighting (as recommended in the study).
- Provide a local circulator connecting senior center, schools, hospital, senior group homes, chapter house, and bus stops.

Figure 0 Ganado/Burnside Location Map



Ganado/Burnside Area Traffic Circulation Study
Draft Working Paper 1: Existing and Future Conditions

2. About

THE PROJECT

This Health Impact Assessment (HIA) provides input about community health impacts that would result from roadway improvements recommended in the Ganado/Burnside Area Traffic Circulation Study that is being conducted by ADOT as part of its Planning Assistance to Rural Areas program. The study area generally includes SR 260 between Ganado and the Burnside traffic circle in Apache County, Arizona within the Navajo Nation. The purpose of the Circulation Study is to:

- Conduct a comprehensive evaluation of study area roadways
- Develop a three-phased Improvement Plan that promotes safety and mobility, supports economic development, and improves community livability.
- Identify specific improvement strategies to address study area needs.

The goal of this HIA is to increase the awareness of the chapter and tribal transportation providers about the connection between transportation and community health.



Looking east in Ganado at the intersection of US 101 and SR 260.

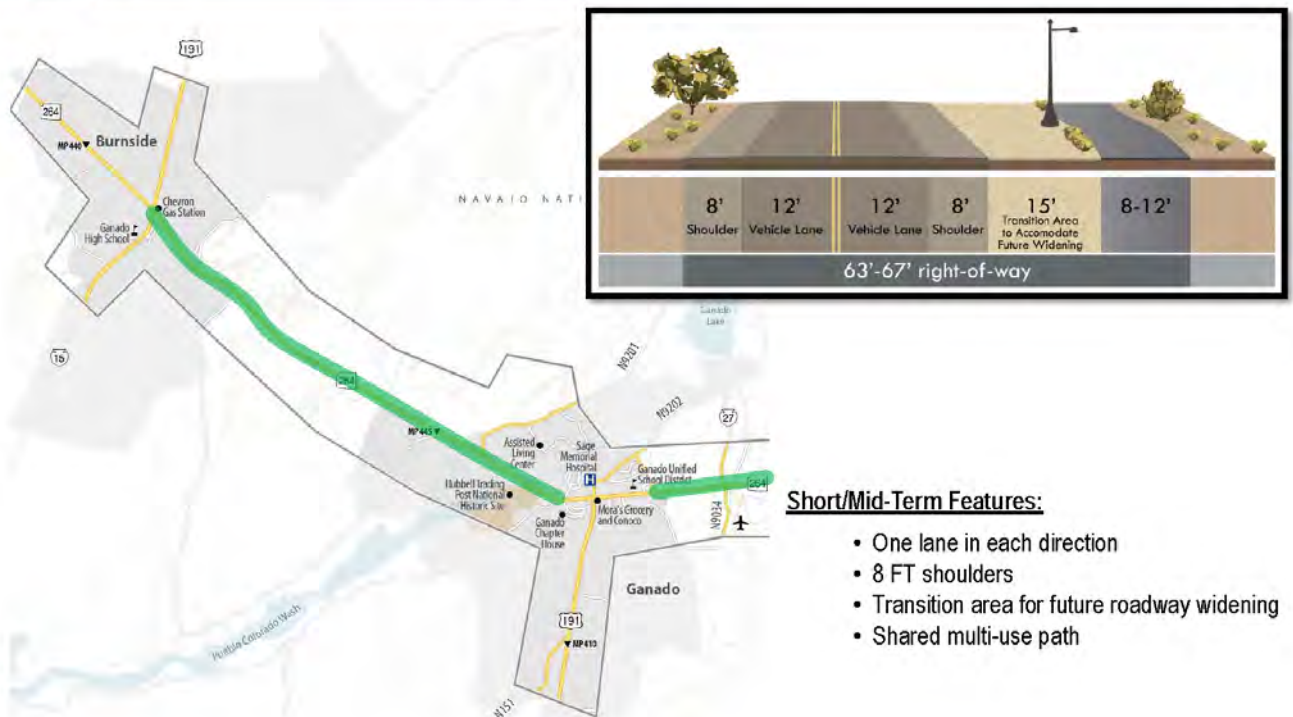
PARA AREA TRAFFIC CIRCULATION STUDY RECOMMENDATIONS EVALUATED BY HIA

Specifically, this HIA evaluates the potential health impacts of the following options recommended in the Ganado/Burnside Area Traffic Circulation Study. The Circulation Study examines transportation improvements to the SR 179/SR191 corridor between and within the communities of Ganado and Burnside, on the Navajo Nation.

BETWEEN GANADO AND BURNSIDE (FIGURE 1: STREET CROSS SECTION SR264)

- Widen the SR 264 shoulder between Ganado and Burnside from 5 feet (planned in 2016) to eight feet over the mid term.
- Provide an eight to 12 foot wide pedestrian path with a 15' buffer from the roadway that can be used for future additional roadway travel lanes over the mid term.
- Widen SR 264 to four lanes (two lanes in each direction) between Ganado and Burnside. This would leave an eight foot shoulder and reduce the buffer between the roadway and shared use path to three feet.

Figure 1: Ultimate Street Cross Section SR 264



SR 264 WITHIN GANADO

- Build to five lanes (2 lanes in each direction with center turn lane), no shoulder
- Provide a six to eight foot sidewalk (lit) buffered from roadway by 3 feet

SR 191 WITHIN GANADO AND BURNSIDE (FIGURE 2: ULTIMATE STREET CROSS SECTIONS GANADO AND BURNSIDE)

- Widening portions of the roadway shoulder to 6 feet south of the intersection with SR 264 in Ganado and south of the Burnside traffic circle
- Provide two vehicle travel lanes
- Optional sidewalks (concrete)
- Lighting

Figure 2: Ultimate Street Cross Sections Ganado and Burnside



SR 191 SOUTH OF GANADO (FIGURE 3: VARIOUS STREETS: CROSS SECTION)

- Provide two vehicle lanes with 6' shoulders
- Provide a 6' trail (on one side of the roadway)

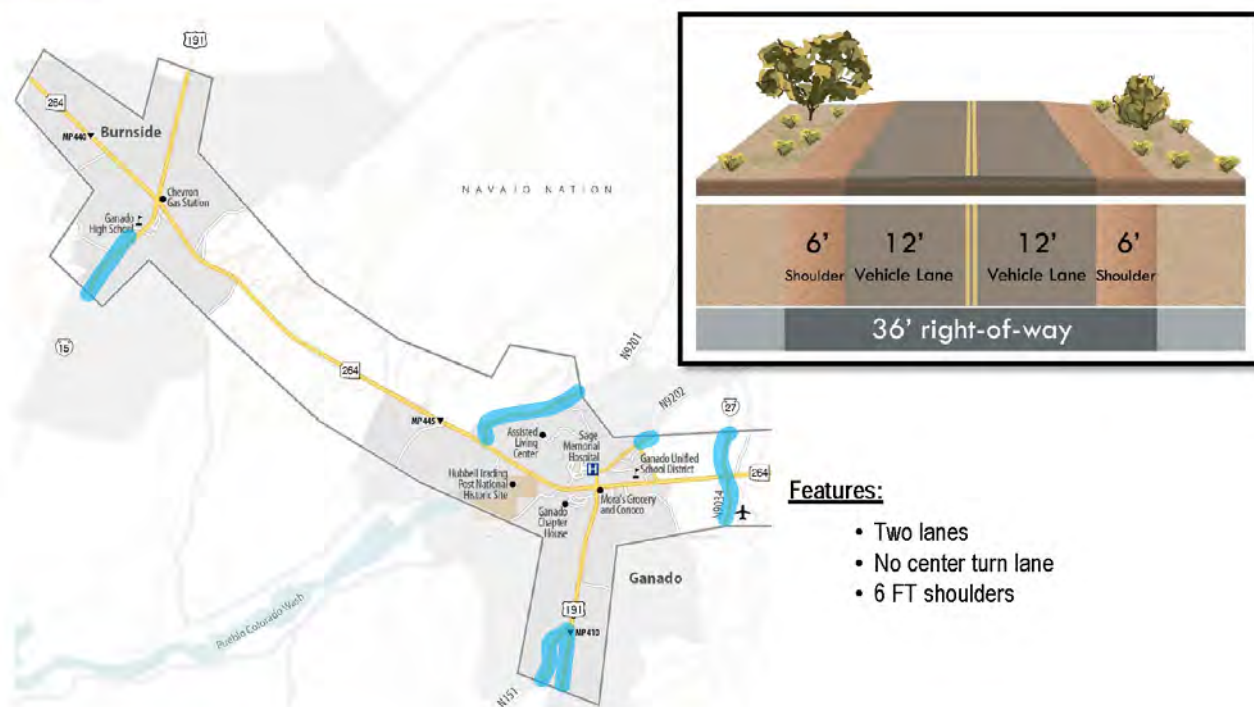
INDIAN 15 SOUTH OF GANADO HIGH SCHOOL, N9201, N9202, INDIAN 27, N151 (FIGURE 3: VARIOUS STREETS: CROSS SECTION)

- Widening portions of the roadway shoulder to 6 feet south of the intersection with SR 264 south of the Burnside traffic circle
- Two vehicle lanes with 6' shoulders

OTHER RECOMMENDATIONS

- Street and wayfinding signs
- Animal warning signs
- Flashing and simple school bus stop and simple intersection signs
- Bus stop platforms on SR 264 and SR 191 south of Ganado with flashers
- Reduced speed limits at Ganado Elementary and Middle School and at Ganado High School
- Sidewalks and crosswalks or roundabouts with pedestrian crossings at SR191 and SR 264 intersection (Ganado) (long term)
- Re-aligning entrance to Hubbel Trading Post, Traffic Calming at school areas and other high pedestrian activity locations

Figure 3: Various Streets: Cross Section



HEALTH IMPACT ASSESSMENTS (HIA)

A Health Impact Assessment (HIA) helps communities and others make informed choices about improving public health through community policies and design. By conducting a HIA, a community can leverage the health benefits of a proposed plan, policy, program, or project by objectively evaluating the potential health impacts or outcomes before it is built or implemented. An HIA can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. The HIA process brings public health issues to the attention of persons who make decisions about areas that fall outside of traditional public health arenas, such as transportation or land use¹.

The National Research Council⁴ defines HIA as “a systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.”²

THE HIA PROCESS

The HIA process includes six steps:

- Screening
- Scoping
- Assessment
- Recommendations
- Reporting
- Monitoring and Evaluation

Screening is the first step of the process. During the screening process, a determination is made if the project is related to the determinants of health and if conducting an HIA will have value to decision makers. Information about determinants of health is located in the Screening chapter of this Assessment.



Source: *The HIA Process*. August 26, 2014. The Pew Charitable Trusts. <http://www.pewtrusts.org/en/about/news-room/news/2014/08/28/the-hia-process>

Scoping identifies the determinants of health and specific health topics that will be addressed in the HIA, and identifies data sources available to conduct the HIA. During scoping, the types and extent of the public engagement process are also outlined in a public engagement plan. The public engagement plan for this HIA is located in Appendix B.

The **Assessment** phase of an HIA is where the baseline health indicators related to the project or policy are described and where the potential health effects of the proposed project or policy are identified.

Recommendations are specific actions included in the HIA that could benefit community health with regards to the proposed project or policy.

Reporting includes activities to inform the community of the HIA recommendations and process.

The **Monitoring and Evaluation** section includes information on ways the process could have been improved, and potential indicators that could be used to monitor the impact of the project and recommendations.

THE RELATIONSHIP OF HEALTH TO TRANSPORTATION

Research links transportation to public and individual health.

On balance, the literature shows that regular physical activity:

- Decreases the risks of cardiovascular disease, colon cancer, and diabetes;
- Maintains muscle strength and joint structure and function;
- Is necessary for normal skeletal development during childhood;
- May relieve depression, anxiety, and other mental illnesses;
- Along with appropriate dietary patterns, may lower obesity levels.

Transportation systems influence our level of physical activity in the following three ways:

1. Mode choice and trip frequency

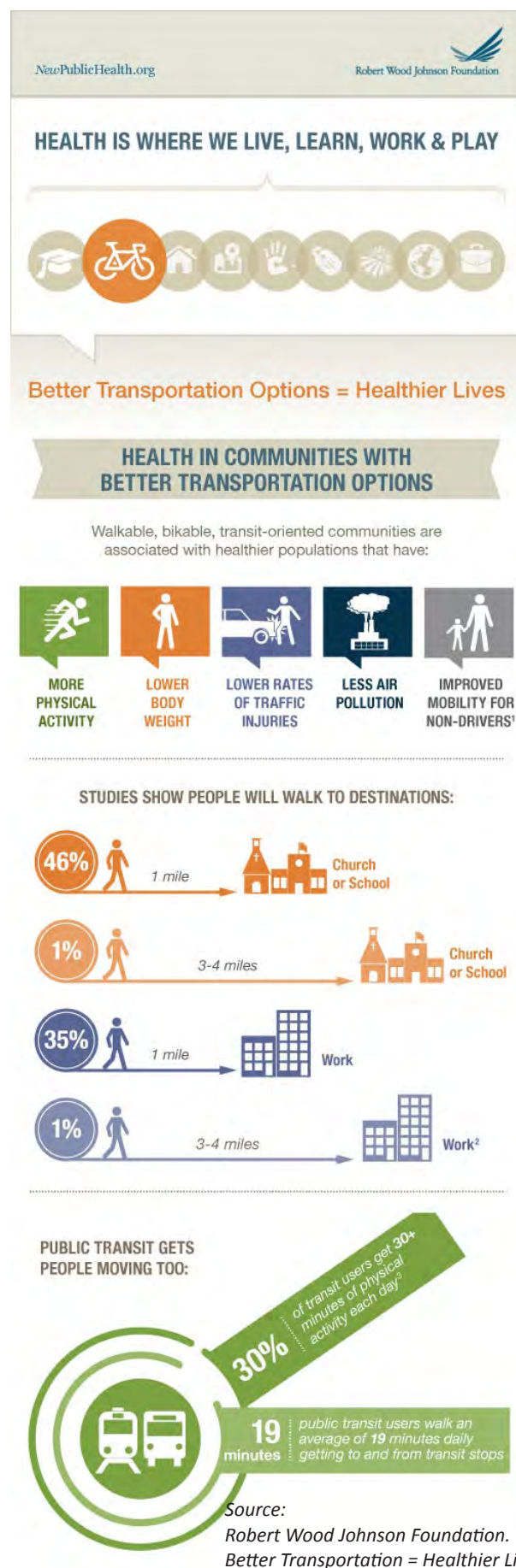
Rural roadway networks are based in farm to market roads, or state and federal highways that are designed to quickly move people and goods between large population centers. Historically, rural roadways do not include pedestrian facilities, except when passing through historic town centers. Most of the literature on creating environments for walking in rural town centers is focused on historic, non-Native American settlements, which were traditionally developed using a grid pattern for the center of the town. In the book titled “True West³”, the importance of roadways that respect natural terrain and topography, that are narrower, and take into the context of the natural and built environment are recommended. In Native American Communities, while distances between locations can be far apart, the culture supports walking. In these communities, transportation networks between disparate locations should be designed to reflect this culturally important mode of travel while maximizing safety.

2. Streets can be designed to facilitate either automobile travel or non-motorized travel.

Streets that are wide, smooth, and straight encourage automobile travel at fast speeds and discourage travel by foot or bicycle. Conversely, streets that are narrow and irregular discourage automobile travel at high speeds. Additionally, streets that incorporate pedestrian and bicycle facilities (bike lanes, sidewalks, crosswalks, etc). and that are calmed (i.e., streets that contain traffic-slowing obstacles and devices) are believed to facilitate more walking and bicycling. In the United States, street design has been dominated by the desire to facilitate the smooth flow of automobile traffic, resulting in design standards for streets that encourage driving and discourage walking and biking.

3. Transportation systems can increase walking and biking

Including separate, dedicated bicycle and pedestrian facilities such as bike paths and walking trails can encourage changes in individual behavior and result in an increase in physical activity⁴.



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3. Screening

INTRODUCTION

Screening is the first phase of a Health Impact Assessment (HIA). During this phase, the value of examining the impact of a proposed project or policy is assessed. The assessment is based on the extent to which the proposal could impact determinants of health related to the physical environment, individual behaviors, and the social environment. Using the findings of the Screening, a determination is made whether to conduct a HIA.

SCREENING SUMMARY

SIGNIFICANCE AND VALUE

The strong relationship between health and transportation provided an incentive for the Arizona Department of Health Services (ADHS) to partner with ADOT through the PARA⁵ program to select projects that could potentially benefit from an HIA. The Ganado - Burnside Area Circulation Study was selected as an HIA candidate because this Circulation Study will identify transportation improvements that will affect physical activity and determinants of health within a rural, Native American, community.



The Framework, developed by FHWA, will help to incorporate public health considerations into the traditional steps in corridor planning. The framework includes many of the same steps as HIA. Source: FHWA Health and Transportation Corridor Planning Framework Fact Sheet. http://www.fhwa.dot.gov/planning/health_in_transportation/research_efforts/framework_fact_sheet/index.cfm

The relationship between transportation and community health is strong. In 2012, the U.S. Department of Transportation Federal Highway Administration (FHWA) formed a Health in Transportation Working Group to:

- Develop a common understanding of health in transportation;
- Identify aspects of existing USDOT programs that relate to health;
- Address stakeholders health-related concerns and communicate these concerns within the agency.

In August 2014, the FHWA Working Group completed its beta testing of a checklist to incorporate public health considerations into the traditional steps in corridor planning. This checklist incorporates many of the steps of HIAs.

The existing and new transportation facilities and other circulation recommendations in the Ganado/Burnside Area Traffic Circulation Study include roadway cross sections, intersection and pedestrian improvements, and a variety of features to improve safety. These facilities will encourage walking and bicycling and increase the overall connectivity and safety of the transportation system within Ganado and Burnside. These facilities can also support activities that are a part of the Navajo culture, economic development, and access to community health facilities, and healthy food⁶. Conducting a health impact assessment can provide valuable information to the community and the Arizona Department of Transportation (ADOT) about the relationship of these improvements to the health of community members, and potentially provide additional information to Navajo Department of Transportation about opportunities to provide transportation facilities that have a beneficial impact on community health. The recommendations of this HIA can also be considered as ADOT prioritizes the types of circulation improvements identified in the Circulation Study.

A hospital, senior center, senior housing facility, and elementary and middle school are also located in Ganado and a high school is located in Burnside. Engaging representatives of these communities in the HIA process could result in identification of partnerships and activities to maximize the benefits of these improvements, and partnerships for monitoring and evaluating the effectiveness of the recommendations in this HIA.

CONTEXT

LOCATION

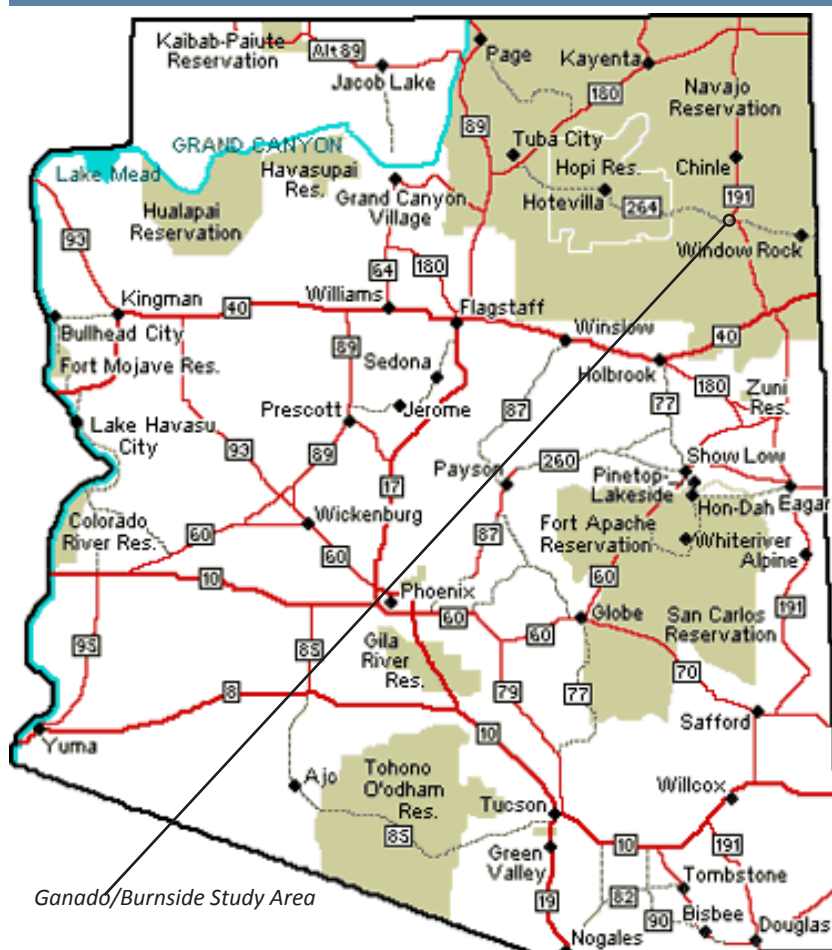
Ganado and Burnside are located in Apache County (Figure 4: Project Location Map), within the Navajo Nation. Burnside is located approximately five miles west of Ganado. Ganado is located approximately 30 miles west of Window Rock, the capitol of the Navajo Nation and 33 miles west of Fort Defiance, the location of the Tsehootsooi Medical Center (Fort Defiance Indian Hospital) managed by the Navajo Nation. Gallup, New Mexico, is 53 miles east of Ganado and is the location of the 99-bed Gallup Indian Health Center, a division of Indian Health Services.

Burnside is along US 191, which is an important route within the reservation and the southwest. US 191 provides access to Canon de Chelly, Moab, and ultimately I-70 which passes through several Colorado resort communities including Vail and Beaver Creek as it connects into Denver.

The Circulation Study includes :

- The area within one mile of SR 260 between Ganado and Burnside
- The area within one mile of US 191 and Indian Route 15 approximately 1.25 miles north and south of their intersection with SR 260 (Burnside Traffic Circle).
- The area within one mile of US191 approximately 1.5 miles south of the Ganado SR260 intersection.

Figure 4: Project Location Map



RELATIONSHIP OF TRANSPORTATION FACILITIES TO THE DETERMINANTS OF HEALTH

Different organizations engaged in promoting health nationally and internationally have different ways of describing what factors determine health. While these descriptions differ, they all generally focus on three general categories: physical environment; social environment; and individual behaviors. To a large extent, individual behavior is influenced by physical and social determinants.

Healthy People 2020⁷, which operates under the auspices of the National Institute of Health Office of Disease Prevention and Health Promotion identifies physical and social determinants of health.

Social determinants identified by Healthy People 2020 directly relevant to transportation include:

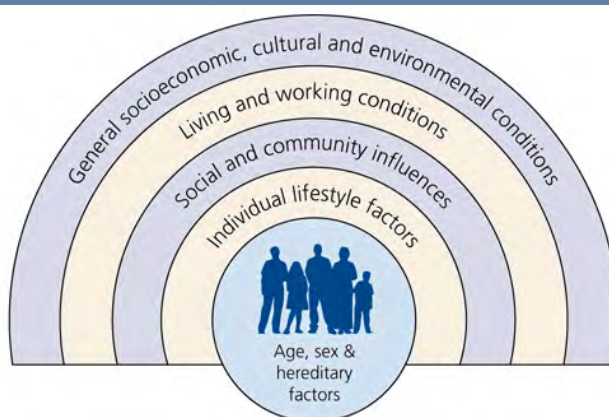
- Transportation Options
- Public Safety

Physical determinants include:

- Built environment, such as buildings, sidewalks, bike lanes, and roads
- Physical barriers, especially for people with disabilities
- Aesthetic elements (e.g., good lighting, trees, and benches)
- Housing and community design.

Transportation facilities along SR260 and US 191 between Ganado and Burnside could provide more transportation options (such as transit, walking, and bicycling), and increase safety by making it safer to walk along or across the roadway, and wait for transit or a school bus. Currently, there are no transportation facilities along these roadways. Additional facilities such as bus shelters, sidewalks, bike lanes, landscaping, lighting, signing, and turn lanes would enhance safety and change the physical environment. Transportation facilities

Determinants of Health



Source: GlobalHealthHub.org. <http://www.globalhealthhub.org/2011/07/18/sdhdeterminants/>

HEALTHY PEOPLE 2020

Social Determinants of Health

- Availability of resources to meet daily needs (e.g., safe housing and local food markets)
- Access to educational, economic, and job opportunities
- Access to health care services
- Quality of education and job training
- Availability of community-based resources in support of community living and opportunities for recreational and leisure-time activities
- Transportation options
- Public safety
- Social support
- Social norms and attitudes (e.g., discrimination, racism, and distrust of government)
- Exposure to crime, violence, and social disorder (e.g., presence of trash and lack of cooperation in a community)
- Socioeconomic conditions (e.g., concentrated poverty and the stressful conditions that accompany it)
- Residential segregation
- Language/Literacy
- Access to mass media and emerging technologies (e.g., cell phones, the Internet, and social media)
- Culture

Physical Determinants of Health

- Natural environment, such as green space (e.g., trees and grass) or weather (e.g., climate change)
- Built environment, such as buildings, sidewalks, bike lanes, and roads
- Work sites, schools, and recreational settings
- Housing and community design
- Exposure to toxic substances and other physical hazards
- Physical barriers, especially for people with disabilities
- Aesthetic elements (e.g., good lighting, trees, and benches)

Source: Healthy People 2020. Determinants of Health. <http://www.healthypeople.gov/2020/about/foundation-health-measures/Determinants-of-Health>. Access Date: June 22, 2015

recommended through this Circulation Study could potentially remove barriers to mobility. Landscaping or other features that provide shade and separate motorized from non-motorized traffic could contribute to the appearance of the roadway. Transportation facilities can enhance community design by providing non-motorized facilities that provide opportunities for physical activity and connect community destinations that are primarily accessible by motorized vehicles.

AFFECT ON VULNERABLE POPULATIONS

This project is focused on the one mile on either side of SR 260 and US 191 between Ganado and Burnside and the approximately one mile north and south along US 191 and Indian Route 15 at the Burnside Roundabout and the area south of SR 260 along US 191 in Ganado. This area includes three schools, a senior center, and senior living facility, and a hospital. Additionally, within Apache County, over 36% of all people live in poverty⁹; twice as high as for Arizona as a whole. All students within the Ganado School District, which includes Burnside, Ganado and several surrounding communities, qualify for the reduced/free lunch program¹⁰.

Determination of Health Impact Assessment Relevance

This Health Impact Assessment meets the screening criteria developed for ADHS under its Arizona Health in Policy and Practice program. Figure 5: Arizona Health in Policy & Practice HIA Screening Criteria¹¹ outlines how this proposal meets Screening Criteria Established for Health Impact Assessments in Arizona.

FIGURE 5: Arizona Health in Policy and Practice HIA Screening Criteria		
Criteria	Response	Discussion
TIER I		
Is there a specific decision being made	Yes	PARAs identify future State and potential future local transportation improvements for a particular area.
Policy Area	Transportation Policy Area	
Proposal Status	Awarded and Active	The PARA was awarded to the Ganado/Burnside Chapter
Proposal Timing	The PARA will start in January of 2015. Planned Completion is Dec. 2015/ Jan. 2016.	The HIA timeframe is from February 2015 through August 2015. This time frame will provide an opportunity for the HIA to provide input to the final PARA recommendations.
Potential Health Impacts (Initial Screening)	Yes	Research indicates that Native American populations are impacted by high rates of chronic diseases. The Arizona Alliance for Livable Communities (AALC) has identified diabetes, heart disease, and other diseases related to substance abuse as main health priorities. Transportation related injuries (pedestrian/vehicle crashes) are also a concern in this area. This area has many elderly residents and also has three schools that serve the large area encompassed by the Ganado Chapter.
Impact on health disparities	Yes	Ganado and Burnside are rural Native American Communities. Rural communities typically have less healthy transportation options.

FIGURE 5: Arizona Health in Policy and Practice HIA Screening Criteria

Criteria	Response	Discussion
Local vs. State	State	This is a State funded project that focuses on State funded roadways. The Circulation Study area and recommendations will also address Bureau of Indian Affairs (BIA) and Navajo Roadways. The Ganado Chapter and Navajo Department of Transportation (NDOT) are Circulation Study participants.
Discretion of Stakeholder Group	Guidance	The PARA includes a Technical Advisory Committee that will drive the decision-making process.
TIER II		
Receptivity of decision makers	High	ADOT is a partner in this pilot effort.
Partners exist to help with HIA	Cross-sector coordination and collaboration is encouraged through the TAC and participation of NDOT.	This HIA will be prepared in partnership with the consultant development the PARA. ADOT and the PARA consultant understand that this process will rely on some data prepared through the PARA process, and that community meetings will be coordinated. Key health stakeholders such as Sage Memorial Hospital, Ganado School District, and the Senior Center will be engaged because their facilities are within the PARA Circulation Study area and they have a commitment to community health.
Potential for systemic and/or institutional change	Potentially	It is possible that stronger relationships between tribal and non-tribal (such as the hospital and trading post) entities could result.

This project was determined to meet the criteria established for conducting an HIA through a partnership and close collaboration with ADOT. This project will result in specific recommendations for transportation facilities. Transportation facilities will provide new and enhanced opportunities for physical activity and could impact individual behavior and the social environment. This project would impact several priority populations from several perspectives, low income/poverty, minority, elderly, and youth. There are existing partnerships and opportunities for cross-sector collaboration.

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4. Scoping

INTRODUCTION

This chapter establishes the framework for understanding the scope of this assessment. In this chapter, the concept of healthy transportation is introduced, information sources about the communities of Ganado and Burnside are identified, and a Pathway Diagram is presented. The Pathway Diagram helps determine the scope of the Assessment by identifying the range of health related topics that could be evaluated in this assessment, based on data availability and other factors. This chapter also identifies specific groups that will be included in the assessment process and the specific outreach techniques that will be used to engage them.



Chapter members attend a community health fair at the Ganado Chapter House.

ABOUT PATHWAY DIAGRAMS

A Pathway Diagram maps out the causal pathways by which health effects might occur. In general, this approach describes effects directly related to the proposal (such as changes in air emissions) and traces them to health determinants (such as air quality) and finally to health outcomes (such as asthma). The first step in the framework is typically a determinant of health, such as air pollution, traffic, employment, or noise. Logic frameworks can be used as part of stakeholder engagement to develop a shared understanding of how a project will develop and the outcomes that can be expected.

Source: Improving Health in the United States: The Role of Health Impact Assessment. National Research Council (US) Committee on Health Impact Assessment. Washington (DC): National Academies Press (US); 2011. <http://www.ncbi.nlm.nih.gov/books/NBK83540/>. Access Date: June 25, 2015.

RELEVANCE TO COMMUNITY HEALTH

The Ganado/Burnside Area Circulation Study provides a variety of opportunities to identify healthy transportation options that can influence determinants of community health. A variety of health determinants that could result from healthy transportation along SR 260 and US 191 between Ganado and Burnside were identified through research and with the input of community members attending a public meeting on May 27, 2015. The identified determinants are connected to key health indicators using a pathways diagram. (Figure 6: Pathways Diagram). Figure 7: Pathways Diagram Explanation Table provides additional information about the health indicators and pathways shown on the pathway diagram.

Figure 6: Pathway Diagram

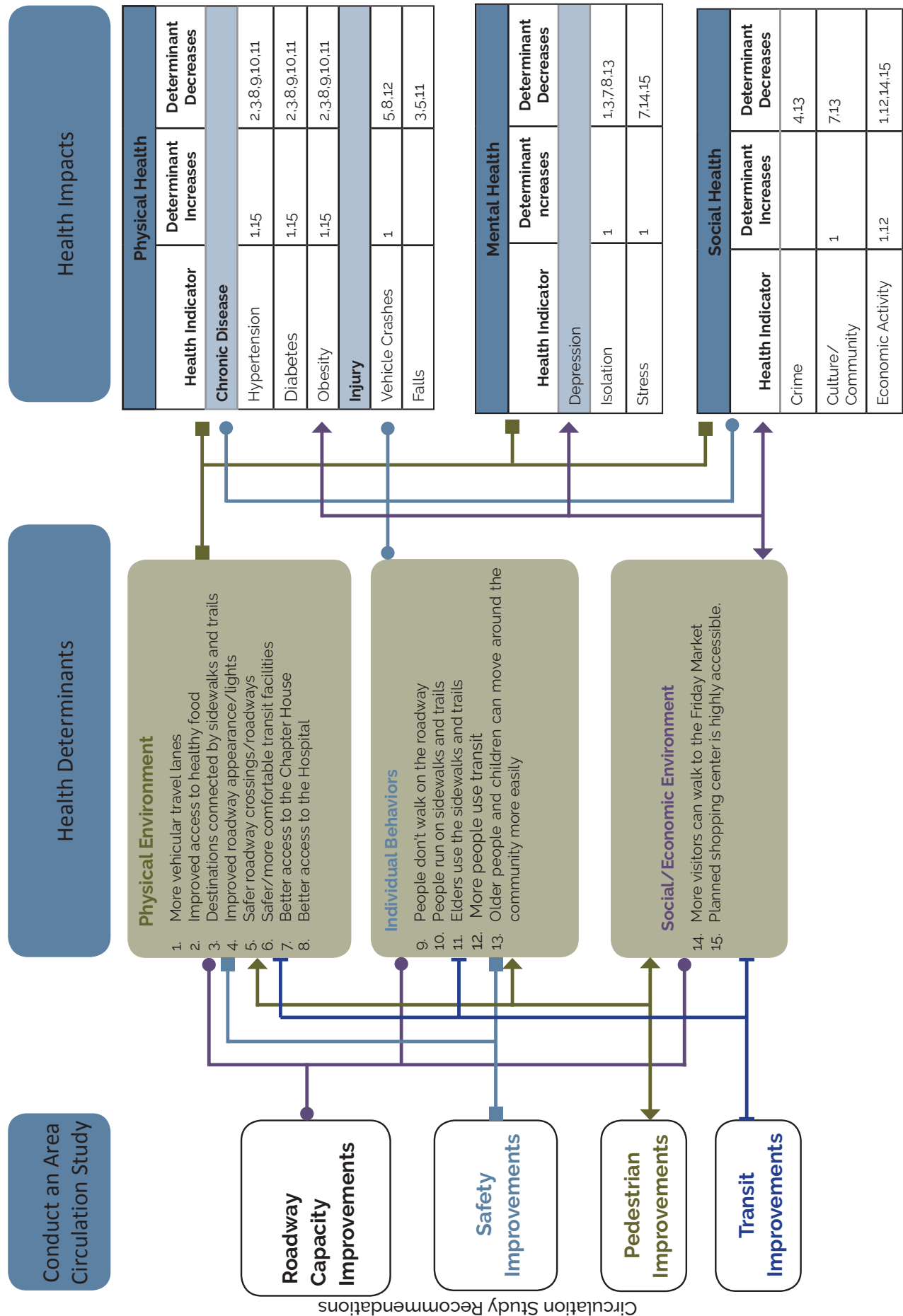


Figure 7: Pathway Explanation Table

PATHWAY	DETERMINANT	DESCRIPTION
1	More Vehicular Travel Lanes	<p>Making it more convenient to drive may result in people walking less.</p> <p>Improving access to the Hubbel Trading post may increase its visibility to tourists, and result in more people who are driving through this area stopping to experience the trading post and shop. In the short term, it could make it easier to shop elsewhere, negatively impacting local businesses and the Friday market.</p> <p>Once the shopping center is built in Burnside, better vehicular access may result in more business and more local employment,, and more access to fast/ convenience food</p> <p>Making it easier to travel by car in Ganado and Burnside may make it easier for more people to access the community, and bringing in more tourists and strangers that could increase stress for local residents. At the same time, it may make it easier to travel to see friends and relatives (or have them visit), reducing isolation.</p>
2	Improved Access To Healthy Food	<p>Making vehicular travel to St. Michael's more efficient could result in people traveling to the grocery store more often, instead of buying unhealthy food at local convenience stores.</p>
3	Destinations Connected By Sidewalks And Trails	<p>This could result in more people walking instead of driving to destinations within Ganado and Burnside. It could also connect tourists visiting the Trading Post to the Friday Market, potentially increasing incomes for the people who sell food and goods there. If more destinations in the Chapter were connected to the Chapter House, more youth and elders could safely walk there are participate in programs that help keep alive cultural traditions.</p>

Figure 7: Pathway Explanation Table

PATHWAY	DETERMINANT	DESCRIPTION
4	Improved Roadway Appearance	<p>More people enjoy walking because of improved environment.</p> <p>Adds to community pride and cultural pride. Reduces depression.</p> <p>More people live in Ganado and Burnside because it is attractive. Reduces population outflow to non-reservation areas. Increases availability of nearby family support systems and sense of community.</p>
5	Safer Roadway Crossings/Roadways	<p>More children walk to and from bus stop</p> <p>More people walk to the hospital</p>
6	Safer/More Comfortable Transit Facilities	<p>More people take transit to Window Rock, Fort Defiance, and Chinle. Increases access to employment and services.</p> <p>More older people use transit because they feel safe. Provides better access to services and health care.</p>
7	Better Access To The Chapter House	<p>Adds to sense of community, better access to community health and other services. Reduces isolation and depression.</p> <p>More people have access to the Chapter House and can participate in community events that increase awareness of traditions and cultural values. Increases sense of community. Increased access can reduce isolation, which is related to depression and can be related to suicide, substance and alcohol abuse.</p>
8	Better Access To The Hospital	More people can reach the hospital and receive preventive care such as regular checkups. Results in less sickness.
9	People Don't Walk On The Roadway	Reduction in pedestrian/vehicle crash injury and fatalities

Figure 7: Pathway Explanation Table

PATHWAY	DETERMINANT	DESCRIPTION
10	People Run On Sidewalks And Trails	<p>People become more culturally aware of traditional activities. Results in a stronger sense of community and cultural traditions. Related to a reduction in crime, depression due to isolation.</p> <p>More people running could result in reduction in obesity and chronic obesity related disease.</p>
11	Elders Use Sidewalks And Trails	Elders less socially isolated and independent. Elders can independently access transit, the Friday market, hospital, and Post Office. Increases access to healthy food, health care for this population.
12	More People Use Transit	<p>More people have regular access to the grocery store in St. Michaels, employment, and the hospital. More people walk from transit to destination. More employment, higher incomes, less depression. More access to healthy food, less obesity and obesity related chronic disease. This could result in less people shopping locally, and impact local businesses and the number of people shopping at the Friday market.</p>
13	Older People And Children Can Move Around The Community More Easily	More ability to move around the community, less social isolation and depression, less alcohol/substance abuse. More community cohesion.
14	More Visitors Can Walk To The Friday Market	More outsiders spending money at local business, higher incomes for local residents. More income, less stress (related to hypertension and depression).
15	Planned Shopping Center Is Highly Accessible.	More access makes shopping center site more developable. A successful shopping center can provide employment opportunities for local residents.

Transportation facilities recommended by the Ganado/Burnside Area Circulation Study will impact the physical, social and mental health of Ganado and Burnside residents and can provide healthy transportation options to individuals working and visiting the Ganado/Burnside area.

Transportation facilities including paved sidewalks and bicycle lanes will remove pedestrians and cyclists from vehicular travel lanes, potentially reducing crashes between vehicles and pedestrians. A paved sidewalk will provide a level surface for walking that could reduce falls. Providing sidewalks, trails and enhanced vehicular connections between community destinations could result in more people walking to locations within Ganado and Burnside, but could also result in more people driving to areas within the community and through the community. Providing safer transit facilities could result in more people taking the bus (and walking to a bus stop), and could also result in more people leaving the community to shop for goods and services. Providing safer school bus stops and roadway crossings for pedestrians at those bus stops could result in more parents allowing children to walk to and from the bus stop. Improved roadway safety could reduce accidents between vehicles and pedestrians along the roadway.

HEALTH OUTCOMES

The Physical Environment, Social Environment and Individual Behavior health determinants are connected to the following health outcomes:

Physical Health

- Chronic Disease
 - Obesity
 - Hypertension (blood pressure)
- Injury
 - Auto Collisions
 - Falls

Mental Health

- Depression
 - Isolation
 - Substance/Alcohol Abuse
- Suicide

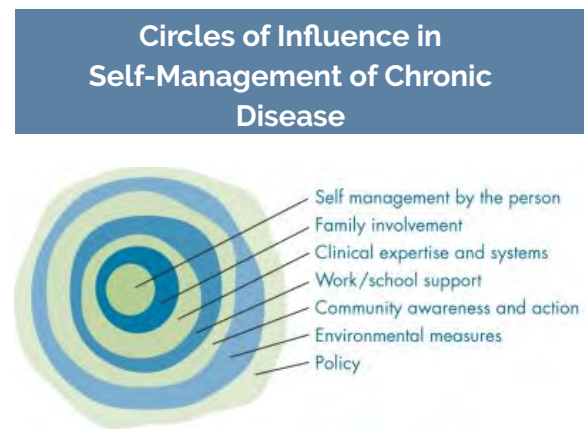
Social Health

- Cultural Traditions
- Sense of Community
- Economic Activity

Based on the Pathways Diagram, non-motorized and enhanced transportation facilities can provide healthy transportation options that have effects on physical, mental and social health.

PHYSICAL HEALTH

Transportation is directly related to our individual health, and the health of our communities. Transportation barriers (such as lack of public transportation or poor transportation facilities) can pose barriers to accessing health care, healthy food, employment, friends and family, and community services. Transportation mode choice impacts our physical activity levels, and consequently, our potential to be affected by activity-related chronic diseases. Chronic Diseases are long-lasting conditions that can be controlled but not cured and include, but are not limited to diseases such as diabetes, obesity and overweight, hypertension (high blood pressure) and heart disease. As described by the Centers for Disease Control, chronic disease is the leading cause of death and disability in the United States. It accounts for 70% of all deaths in the U.S., which is 1.7 million each year¹². Mode choice also impacts our connectedness to our communities; people who walk and use public transportation are more likely to have more social interactions with others in their community than those using personal vehicles.



Source: Center for Management of Chronic Disease. "What is Chronic Disease?"
<http://cmcd.sph.umich.edu/what-is-chronic-disease.html>.
Access date: September 8, 2015.

MENTAL HEALTH

Non-motorized transportation facilities provide opportunities for people to increase the amount of physical activity and exercise associated with travel. The strongest evidence suggests that physical activity and exercise probably alleviate some symptoms associated with mild to moderate depression. The evidence also suggests that physical activity and exercise might provide a beneficial adjunct for alcoholism and substance abuse programs; improve self-image, social skills, and cognitive functioning; reduce the symptoms of anxiety; and alter aspects of coronary-prone (Type A) behavior and physiological response to stressors¹³. Social interactions that arise while waiting for a bus, or walking to a destination also reduce social isolation; an important contributor to depression.

SOCIAL HEALTH

By providing facilities that can support traditional activities such as running and that connect community destinations chapter members can feel more connected to one another. Individuals, especially those who are older, lacking social connections or report frequent feelings of loneliness tend to suffer higher rates of morbidity and mortality, as well as infection, depression, and cognitive decline¹⁴.

SPECIFIC HEALTH OUTCOMES EVALUATED IN THIS ASSESSMENT

Based on community opinion and the pathways diagram, the specific health areas of focus in this assessment are Physical Health indicators (chronic diseases such as obesity, diabetes, heart disease, and hypertension and injuries due to motor vehicle crashes), Mental Health (isolation and depression), and Social Health (sense of community, culture, and economy).

DATA RESOURCES

County-wide data on physical health is available. Some tribal data is also available. Limited data is available for the Ganado District only. Data is also available from the Ganado Fire Department. Limited data is available from the Sage Memorial Hospital.

The following data sources were identified for this project:

- Census
- Robert Wood Johnson Foundation County Health Rankings and Roadmaps
- Navajo Nation Demographic Report
- Crash Data from ADOT
- Sage Memorial Hospital Health Needs Assessment and Implementation Plan
- 2015 Monthly Statistic Run Count for Emergency Calls in Ganado (Indian Health Service)
- Ganado Fire Department Emergency Call Data

It is anticipated that other sources of data will be identified during data collection.

PUBLIC ENGAGEMENT

Engaging the community for this Assessment was accomplished through:

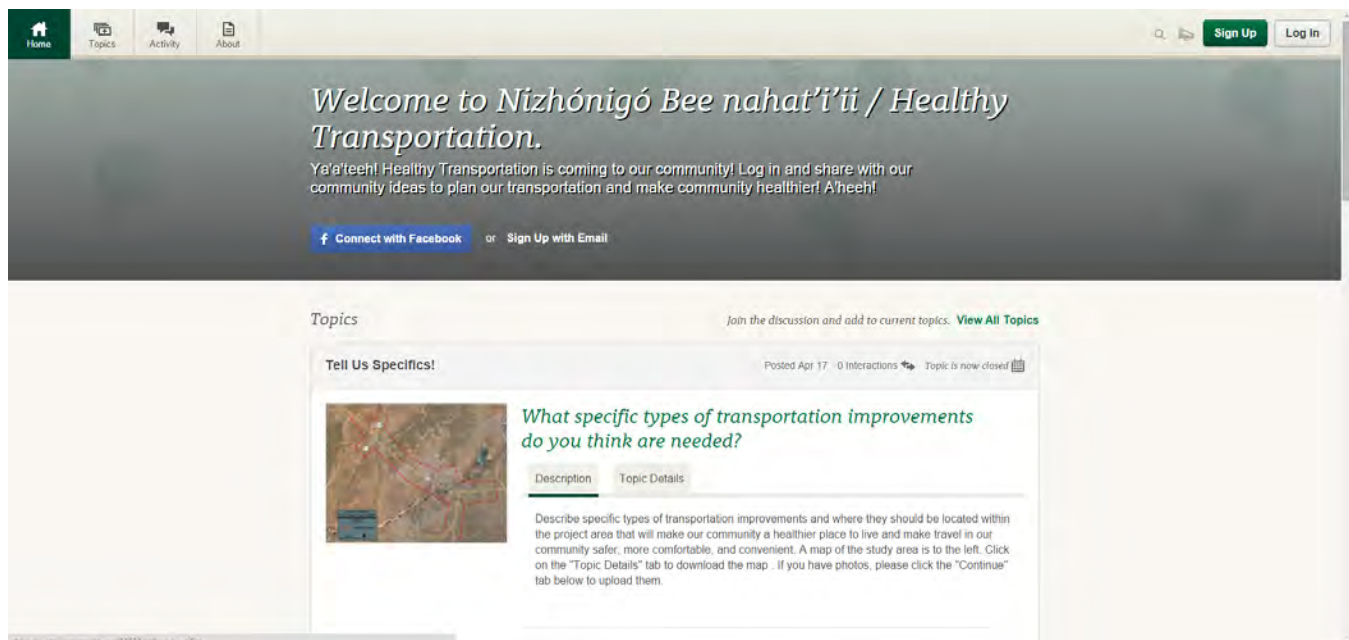
- A meeting with tribal elders
- Participation in a Community Meeting (in conjunction with the PARA)
- Face-to-face surveys at the Burnside traffic circle, Giant Market, and at the community health fair
- Participation in two Technical Advisory Committee Meetings (in conjunction with the PARA)
- Creation of a web page to encourage online participation

Public engagement is detailed in the public engagement plan located in Appendix B. The Technical Advisory Committee included representatives from the Navajo Department of Transportation (NDOT), Sage Memorial Hospital, the Ganado Chapter Council and Chapter Administration, Indian Health Service, the Ganado School District, Navajo Nation Project Development Department, Navajo Nation Housing, Apache County District II Engineering, and ADOT.

Online outreach was through mysidewalk®.com. The website included videos describing the concepts of Healthy Transportation and asking about healthy transportation opportunities and challenges in Ganado. Community members were informed of the site via notices distributed throughout the Chapter, included on all meeting advertisements, posted on the Chapter Facebook page, and distributed to stakeholders.

TIME FRAMES AND BENEFITS OF THIS HIA

This Health Impact Assessment will provide input into the final recommendations developed through the ADOT PARA process and will be included as an Appendix of the final Circulation Study document. This document will provide a guide to ADOT and Navajo Department of Transportation (NDOT) transportation investments over the next 10 to 20 years.



A screenshot of the Ganado/Burnside HIA web page. This site was not used by area residents despite extensive advertising and outreach.

5. Assessment

INTRODUCTION

The Assessment includes data and findings that generally describe current health challenges facing the Navajo Nation and the Chapter, and how the transportation improvements under consideration in the Ganado/Burnside Area Traffic Circulation Study could affect community health.

SOCIOECONOMIC OVERVIEW

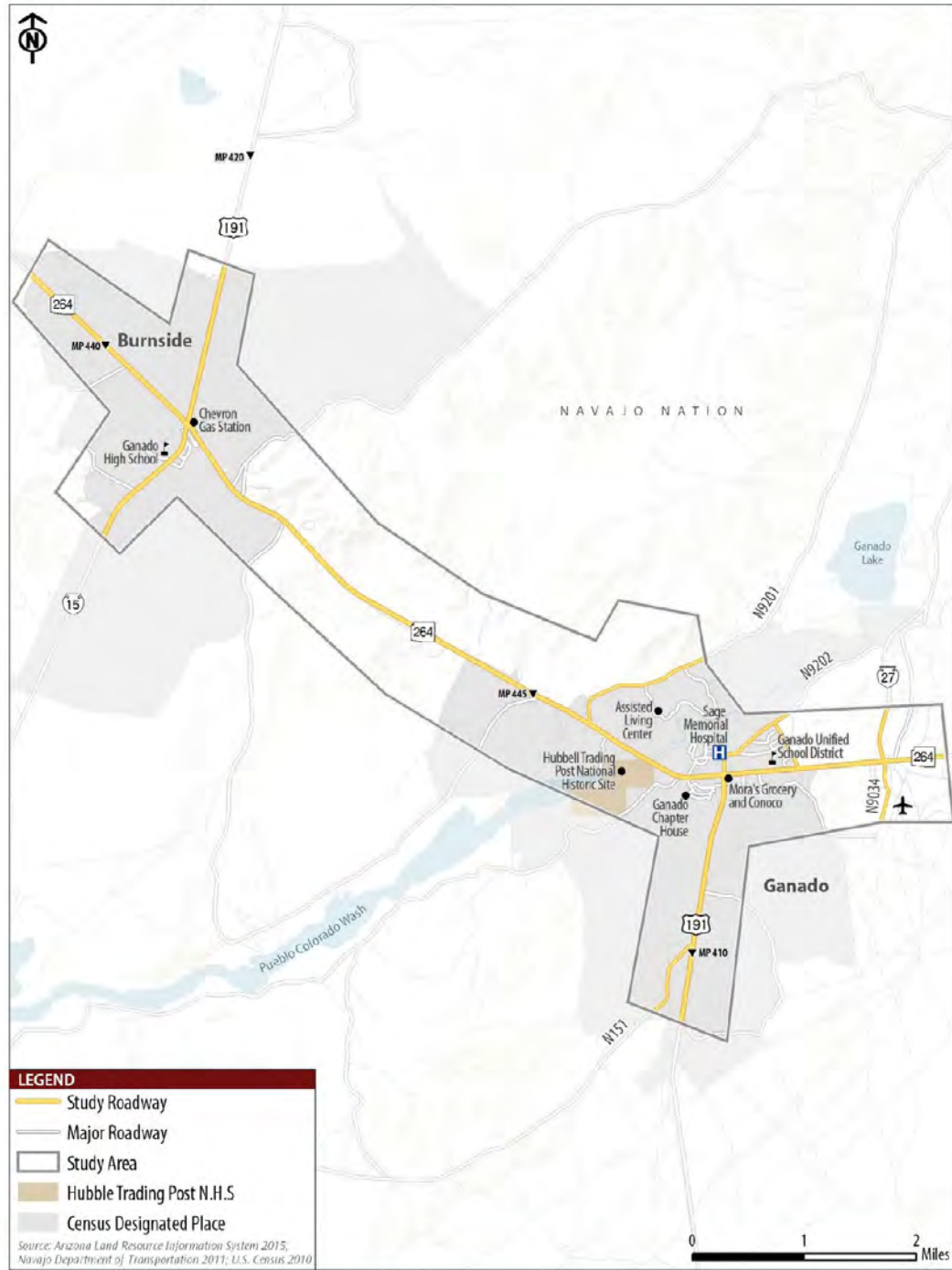
GANADO

Ganado lies at the crossroads of SR264 and SR 191, and is east of Burnside . It is the most developed area in the Ganado Chapter. The Ganado Chapter includes the communities of Ganado and Burnside. Ganado is the location of Chapter administrative offices including the fire station, Chapter House, Sage Memorial Hospital, post office, a senior center and a senior citizen group home, Ganado Elementary and Middle School and the Hubbel Trading Post, the oldest operating trading post on the Navajo Nation. Other community destinations, such as a small market, gas station is located in Ganado. A local market his held every Friday in Ganado at the northeast corner of US191 and SR 264 intersection. (Figure 8: Ganado And Burnside Features). The intersection of US191 and SR264 forms the center of Ganado and a major travelway from Interstate 40 north through the reservation and connecting the major population centers of Chinle with Window Rock and Ft. Defiance, Arizona and Gallup, New Mexico.

Some Navajo housing developments and individual housing are located within Ganado. Ganado's 2010 CDP (Census Designated Place) population is 1,210 people. This represents a 19% decline from Ganado's 2000 population. Ganado is smaller than nearby Fort Defiance (population 3,624), which is also home to the Navajo Run Tsehootsooi Medical Center/Nahat'a Dził Health Center. The median age of Ganado's population is 29.4 years, as compared to Fort Defiance (28.3) and Burnside (21.7). Over the 2000 to 2010 decade, Ganado's under age 65 population declined 75% while the population 65 and over increased 28%. While other active areas on the reservation also experienced large declines in younger residents (for example, nearby Fort Defiance's under 65 years old population declined 43% during the same time frame), Ganado's decline was more severe and higher than that of other communities. The percentage of Ganado 2010 CDP population 65 years old and over is 9%, and 15% for the State as a whole.

Figure 8: Ganado And Burnside Features

Figure 1.1. Study Area



Ganado/Burnside Area Traffic Circulation Study
Draft Working Paper 1: Existing and Future Conditions

Source: Ganado/Burnside Area Traffic Circulation Study Working Paper 1. May 2015.

14% of Ganado's residents are householders over 65 who live alone. This is higher than Apache County (11%) and Burnside (7%). Median household income in Ganado is \$26,528, lower than that of Apache County (\$31,476) and Burnside (\$27,917).

According to the US Census, the vast majority (90%) of 2010 residents in Ganado are Navajo. Other residents living in Ganado are mostly associated with the Sage Memorial Hospital or married to tribal members.

BURNSIDE

Burnside includes the Ganado High School, a housing developments that includes single family homes and apartments, a McDonald's, and a convenience store. The McDonald's is the only restaurant in a 50+ mile radius of Burnside. It is used by locals and travelers and offers a range of options including salads, fruit, and unsweetened drinks. The Navajo Transit stop is located in Burnside outside the convenience store. Burnside also is the location of the Burnside roundabout, a traffic control device designed to manage through traffic on SR 191 (northbound) and SR 264 (east/west bound). US191 and SR 264 are main roadways through Burnside connecting the major tribal population and employment centers of Tuba City (2010 population 8,611) to Window Rock and Fort Defiance, and Gallup New Mexico.

Burnside's 2010 population is 537. Eight percent of the Burnside 2010 population is over 65. The population of Burnside also decreased from 2000 to 2010 by 15%. Although Burnside is currently a smaller community than Ganado, in the future, the tribe plans to add housing and a shopping center at the northwest corner of the intersection between SR 264 and US 191. The shopping center is planned to have a grocery store and other services. This will increase local and regional traffic to Burnside.

Some houses are located between Burnside and Ganado on both sides of SR 264. Several, unpaved local access roads to housing located more than one mile from SR 264 and outside the study area intersect with SR 264.

APACHE COUNTY

Apache County is the northeastern most county in Arizona. It is a rural county that includes small towns and a large portions of the Navajo and Hopi reservations. Two-thirds of the population, and over one-half of the land area is comprised of the Navajo Nation¹⁵. Of all Arizona Counties, Apache County has the largest Native American population. The 11, 197 square mile county is the largest in Arizona. It is Arizona's tenth most populous¹⁶, and third most rural of all Arizona counties.¹⁷

Almost 2/3, or 73 percent of Apache County 2013 population is Native American, as compared to 5% for Arizona as a whole. The balance of the population is 19% white, six percent Hispanic or Latino, and the balance other races. Based on this, county health data can provide a good indication of tribal trends¹⁸. Ganado and Burnside are separate Census County Divisions.

NAVAJO NATION

The Navajo (Diné) are the largest Native American Tribe in the U.S. The 27,000 square mile Navajo Nation (Diné Bikéyah translated as Navajoland) is larger than 10 of the 50 states in America

and includes land in Utah, and New Mexico¹⁹. In Arizona the nation includes land in Navajo and Coconino Counties, as well as Apache County. The 2010 population of the Navajo Nation living on the reservation is 173,667. The population living on-reservation declined 3.9% decline from 2000 to 2010. Slightly over half of the nation's population lives in Arizona, and almost half of the Arizona Navajo population lives in Apache County²⁰.

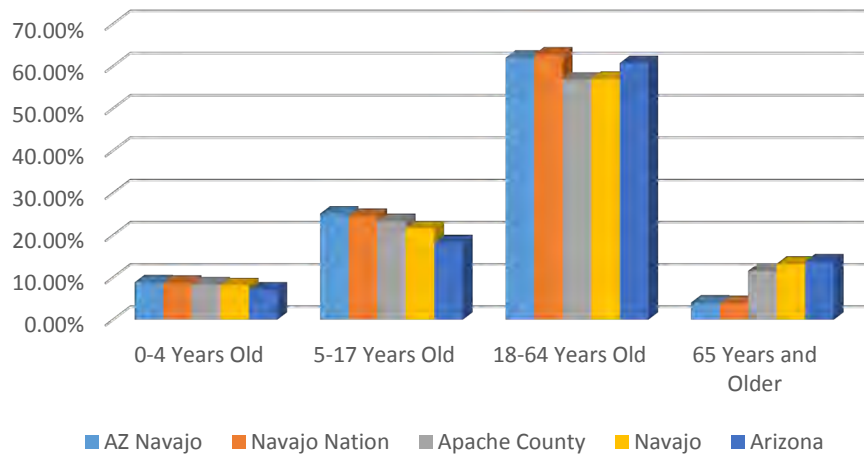
The Navajo are generally younger than the overall county and state populations (Figure 9: Age by Tribe, County and State).

34% of the 2010 population in Arizona is under 18 years old. Within the Sage Memorial Hospital Service area²¹ 27% of the population is under 18 years old. Seventeen percent of the service area population is over age 60.

Households on the Navajo Nation (26%) (regardless of state) are twice as likely as the State of Arizona (12%) to be headed by a single mother. More households

with children under the age of 18 are on the Navajo Nation (49%) than in Arizona (34%). This is important because children with single parents are often responsible for their own transportation after school. Children under age 18 are four times more likely to live with grandparents on the Navajo Nation (8.6%) than they are, for example, in the State of Arizona (2.3%). There are few differences between the proportions of children by age living with grandparents, when comparing the Navajo Nation populations in Arizona, New Mexico or Utah²².

Figure 9: Age by Tribe, County and State (2010)



Source: U.S. Census

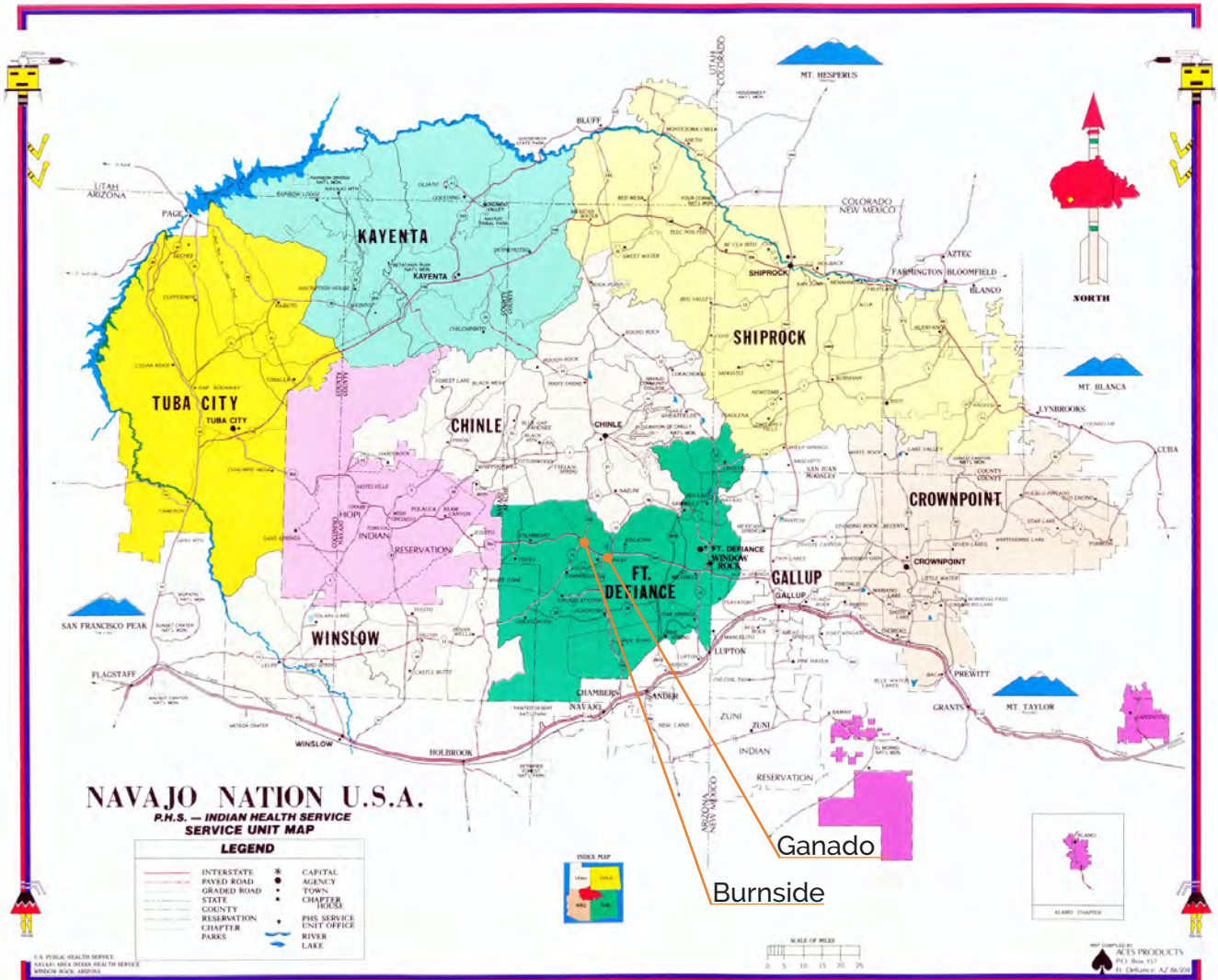
HEALTH DETERMINANTS OVERVIEW

HEALTHCARE FACILITIES

Ganado and Burnside are located in the southern portion of Navajo Nation in the Fort Defiance Service area of IHS. (Figure 10: Navajo Nation Indian Health Services Unit Map). The Tséhootsooi Medical Center, a Navajo Operated Hospital, is located in Fort Defiance. The Medical Center offers a full range of inpatient and out patient services, and emergency room services. The facility was constructed in 2002. It currently has 50 inpatient beds: Med-Surgery with 14 beds, Pediatrics with 6 beds, OB-GYN with 12 beds, ICU with 4 beds, and 14 beds for the adolescent psychiatric unit.

The 25-bed Sage Memorial Medical Center is located in Ganado. The hospital and buildings are owned by the Presbytery of Grand Canyon and leased to the Navajo Health Foundation/Sage Memorial Hospital. The hospital includes a remarkable campus that reflects its long history in the community. A hospital has been located in Ganado since the early 1900's. The first hospital was

Figure 10: Navajo Nation Indian Health Service Unit Map



Source: Indian Health Service. <http://www.ihs.gov/navajo/>



Source: G.E.E. Lindquist NATIVE AMERICAN PHOTOGRAPHS. The Burke Library Archives @ Columbia University. http://lindquist.cul.columbia.edu/catalog/burke_lindq_035_0006. Access Date: September 2, 2015.



Source: Razaghi Healthcare. Sage Memorial Hospital website. Access Date: September 2, 2015.

Historic Sage Memorial Hospital 1930's and the hospital today.

established by Dr. James Kennedy in 1911. Sage Memorial Hospital was established by Dr. Clarence Salsbury in 1930 as an outgrowth of the nursing school that he established at the Ganado Mission. The nursing school trained women from more than twenty tribes and several foreign countries²³.

Sage provides inpatient and outpatient care, and has an emergency services facility. An August 2015 court decision requires the Indian Health Service to continue to contract with Sage through 2017, and the hospital looks forward to reestablishing a sound, productive relationship with IHS for the benefit of our Chapter patient communities²⁴. This is relevant because without this relationship, many chapter members would have to travel to Fort Defiance for Medical Care.

The Annie Wanueka Life Home are 25-bed senior group home is located in Ganado and is the only Senior living facility in Ganado and Burnside. The facility uses three ADOT vans to transport residents to nearby destinations, and private transport companies to transport residents longer distances. Most of the residents are from the Ganado Chapter²⁴. The Life Home is located on the north side of SR264 just east of the Sage Memorial Hospital.

EMPLOYMENT AND INCOME

In 2010, 38% of the Navajo Nation lived in poverty, and 38% of all Navajo over age 65 years old lived in poverty. Twenty percent of the Sage Memorial Hospital Service Area residents live in poverty. The largest number of people living below the poverty line within the service area are individuals. Within the Sage Memorial Hospital service area, the smallest number of people living in poverty were over 65 years old. The Sage Memorial Hospital Community Health Needs Assessment estimates unemployment within it's service area around 23 percent²⁵.

Ganado and Burnside are rural areas with numbers of people living in poverty. In 2010, 22 percent of all Ganado households and 18 percent of households with children were living in poverty, and all of those households were single parent households. Additionally, 37 percent of all people living in poverty in Ganado are over age 65. In 2010, 37 percent of all Burnside households and 52.1 percent of all households with children were living in poverty. 44 percent of all people over age 65 in Burnside were living in poverty in 2010²⁷.

CULTURE

Navajo Culture is grounded in concepts of harmony with the community and nature. "Walk in beauty" is a loose translation of the Navajo phrase ah "naagh1i bik'eh hozh" that is often quoted as representing the essence of Navajo philosophy. In Navajo, this phrase expresses the Navajo view of how to live a proper life. Beauty, a central idea in Navajo thinking, means far more than outward appearance: it means order, harmony, blessedness, pleasantness, everything that is good, not evil, everything that is favorable to mankind, this being the overall goal to which everyone and everything should strive. This ideal should be achieved by living a long life.

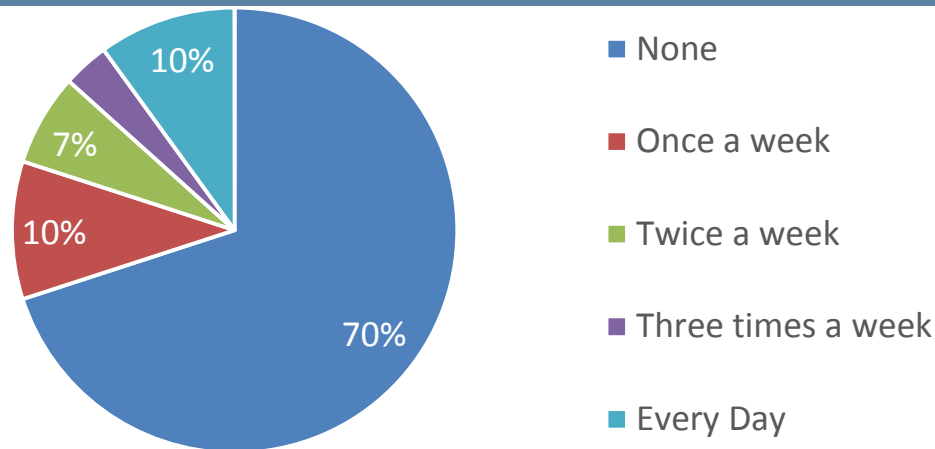
PHYSICAL ACTIVITY

Walking is important to Navajo culture. In interviews at the Senior Center, many elders stated they are often concerned about walking on dirt roads as they are uneven, and the elders are afraid of falling. Many elders stated during a healthy transportation presentation meeting at the

senior center that they would like to walk daily, and would like to have walking trails that they could use with their friends. Staff at the Annie Wanueka Life Home stated that most residents are independently mobile, and would like to walk more. Currently, no walking trails exist between the group home or the Senior Center and SR264, (Figure 11: Percent of Survey Respondents Walking More Than Once A Week).

Walking is an important mode of transportation for people in Ganado and Burnside, and in these communities, people walk significantly more than they do in Apache County as a whole. In 2010, the U.S. Census reports 5.6 percent of Apache County residents walked to work. In that same

Figure 11: Percent of Survey Respondents Walking More Than Once A Week: Ganado and Burnside



year, 16% of Ganado residents and 31.5% of Burnside residents reported walking to work. This information is supported by informal interviews conducted in May, 2015 in Ganado and Burnside that found almost 30% of respondents walked to destinations within Ganado and Burnside at least once a week. Additionally, many Navajo do not have access to cars. While there are no statistics on hitchhiking, it is common to see people along roads within the Navajo Nation using hitchhiking to extend their foot-based trips.

In Navajo Culture, and especially in Ganado, running is a point of pride. Alvina Begay, from Ganado Arizona, is a long distance runner and ambassador for Nike N7; she qualified for the U.S. Olympic trials in 2012. Running is also a Navajo tradition that arose out of a spiritual desire to honor the earth, the sky and everything sacred. Additionally, Native Americans have long understood and appreciated the positive benefits of running. They believe running creates a healthy and strong body, increases one's energy and drives away feelings of unhappiness. Prior to their encounter with Pueblo tribes and Europeans, they did not utilize extensive horticulture techniques or have horses and other livestock, so they also relied on running for hunting and other kinds of food gathering. Running further served as a practical means of trade and communication between neighboring communities and tribes²⁸. In Ganado, many school children run behind the Middle and Elementary Schools.

SUMMARY

Transportation options can affect many of the determinants of health including poverty, employment, family composition, age, and culture. The following should be considered when planning for transportation within the Ganado and Burnside Area.

- Older people who may not drive, or who may have driving challenges (such as delayed reaction times), are caring for grandchildren. Younger children may need to be transported to school and after school activities, doctor's appointments and other destinations. As a result, safe transportation facilities and facilities for people who do not drive (some elders may not be able to drive or never learned to drive) are important transportation planning considerations. While statistics on the number of older drivers on the nation are not available, a 2008 study found that men over age 65 were in the fourth highest group to be involved in automobile crashes²⁹.
- Many studies on elderly mobility in Native American communities identify elderly mobility as a primary health issue. A recent National Center on Senior Transportation Study³⁰ states "for those Tribal members who cannot afford to maintain a vehicle, and whose friends and family may not be able to provide assistance, getting from place to place may be extremely difficult.
- Walking is an important and traditional mode of transportation in Ganado and Burnside.
- Walking and running are important elements of Navajo culture.

HEALTH REPORTING

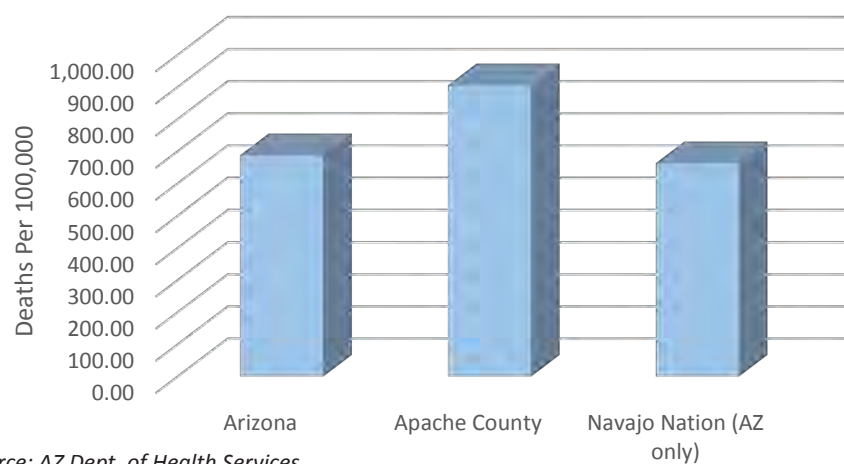
The 2015 Robert Wood Johnson Foundation (RWJF) County Health Rankings put Apache County 13th out of 15 counties for overall health³¹. The ranking considers health determinants including Length of Life, Health Behaviors, Clinical Care, Social and Economic Factors, and the Physical Environment.

MORTALITY

General

Apache County has a higher 2013 rate of death than Arizona³² as a whole, and than the Navajo Nation³⁰ (Arizona only) as a whole. The Robert Wood Johnson Foundation 2015 County Health Rankings and Road maps Report, which uses data from a variety of reputable sources such as the Behavioral Risk Surveillance System³³ and the National Center for Health Statistics, ranks Apache County highest of all Arizona counties for age-adjusted mortality. (Figure 12: Total Deaths, Arizona, Apache County and Navajo Nation (AZ Only) 2013).

Figure 12: Total Deaths, Arizona, Apache County and Navajo Nation (AZ Only) 2013



The county also has statistically higher rates of death due to diabetes, cerebrovascular disease (stroke) and suicides. While death due to drugs in Apache County is among the lowest of all Arizona counties, alcohol related deaths, with the exception of cardiovascular disease, is the highest cause of death on the Navajo Nation (2013 statistics not available for AZ or Apache County). The rate of death due to alcohol on the Navajo Nation is also substantially higher than the rate of death due to drugs in Arizona or in Apache county³⁴. (Figure 13: Causes of Death: Arizona, Apache County, Navajo Nation (AZ Only) 2013).

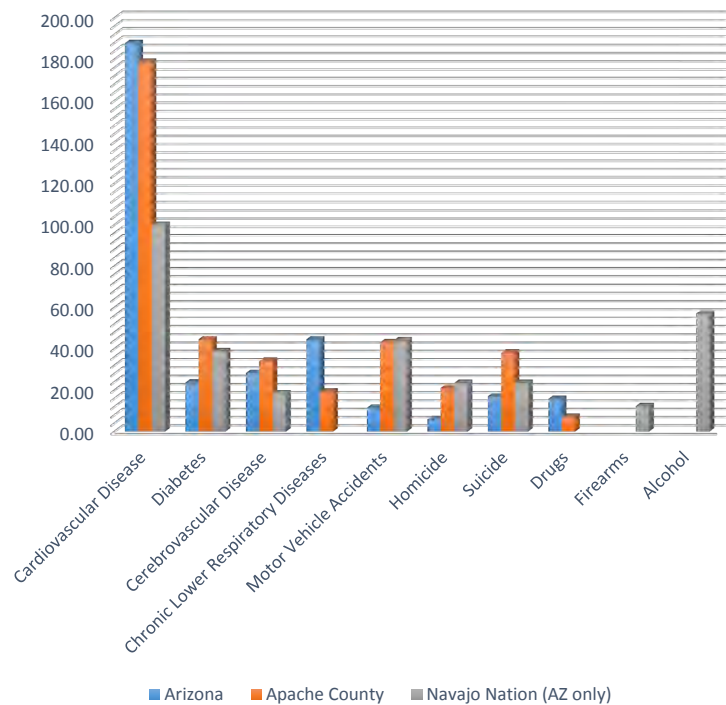
Deaths due to motor vehicle accidents are the third leading cause of death on the Navajo Nation, and the fourth leading cause of death in Apache County. Motor vehicle accidents result in a higher rate of deaths on the Navajo nation than they do in any county in Arizona. With the exception of Apache County, the rate of death due to auto accidents is 30 percent higher than in the adjacent Navajo County.

MORBIDITY

Diabetes

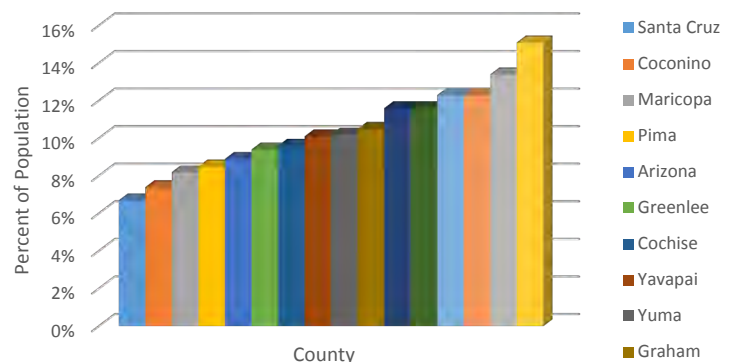
Apache County has the highest percent of population with diabetes of all Arizona counties (Figure 14: Population (%) with Diabetes). Sage Memorial Hospital reports it treated population representing 5.6 percent of it's service area for Diabetes in 2010-2012³⁵. The hospital recognizes that the percent of patients treated at the hospital represents a fraction of the expected diabetes rate for it's service area³⁶, and concludes that many are not receiving treatment for diabetes. It is also possible that many people with type II diabetes (which does not present with symptoms) do not know they have it, or are receiving treatment at the hospital in Fort Defiance, as Sage and IHS have been in a contract dispute that has affected its reputation among some residents.

Figure 13: Causes of Death: Arizona, Apache County, Navajo Nation (AZ Only) 2013



Source: AZ Department of Health Services

Figure 14: Population (%) with Diabetes



Source Robert Wood Johnson Foundation County Health Rankings and Roadmaps 2015.

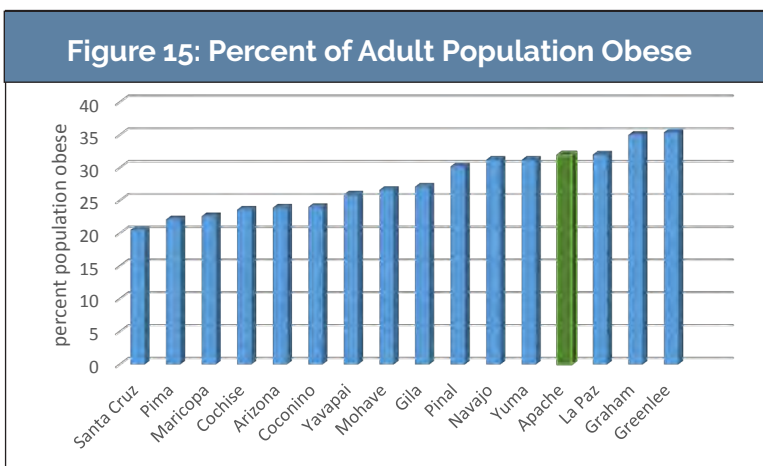
Type 2 diabetes is the most common form of diabetes. In Type 2 diabetes, the body either doesn't make enough insulin or can't use its own insulin as well as it should. The risk of having Type 2 diabetes increases as a person gets older. The cause of Type 2 diabetes is largely unknown, but genetics and lifestyle clearly play roles. Type 2 diabetes has been linked to obesity, genetic risk factors, and inactivity. Some racial and ethnic groups are at higher risk for Type 2 diabetes. These include American Indians, African Americans, Hispanics/Latinos, Asian Americans and Pacific Islanders. There is no known way to cure Type 2 diabetes, but it can be controlled by keeping the level of glucose (sugar) in the blood within a normal range³⁷.

Heart Disease

Cardiovascular Disease (heart disease) is the largest cause of death on the Navajo Nation and in Apache County. Although this is the leading cause of death in the County and among the Navajo, Apache County ranks 10th out of the 15 Arizona counties in the incidence of all heart disease and of cardiovascular heart disease. The National Heart, Lung, and Blood Institute of the National Institutes of Health (NIH) states cardiovascular disease is caused by smoking, high amounts of certain fats and cholesterol in the blood, high blood pressure (which can be caused by obesity and stress), diabetes, and blood vessel inflammation³⁸.

Obesity

Apache County has a high percent of population that is obese. Thirty-two (32) percent of the county is obese. Greenlee County has the largest percentage of obese residents (35%). Twenty four (24) percent of Arizona's population is obese. (Figure 15: Percent of Adult Population Obese)³⁹. Obesity is related to all types of chronic diseases, and can also limit mobility, and result in social isolation.



Source: Robert Wood Johnson Foundation. County Health Rankings and Road maps. <http://www.countyhealthrankings.org/>. Access Date: June 25, 2015

FOOD ENVIRONMENT

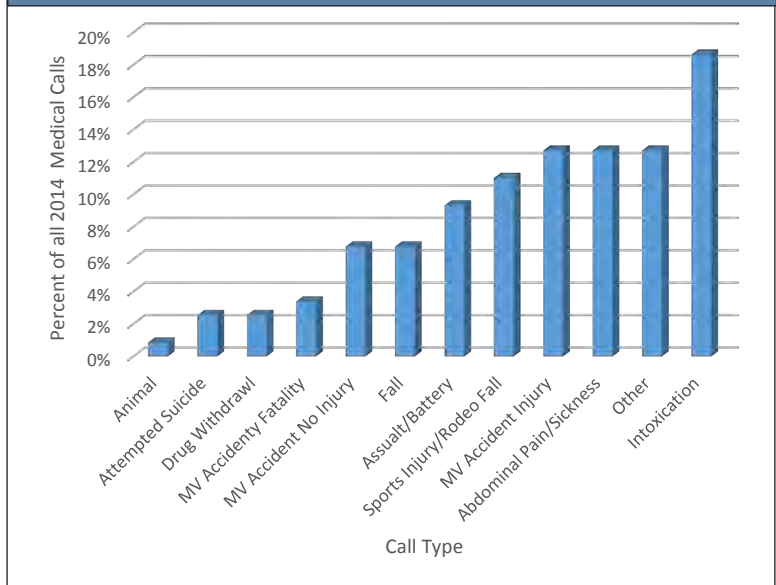
There are no full-service grocery stores in Ganado or Burnside. The International Business Times reports that one study found as much as 80 percent of the food found in reservation stores - often retailers like convenience stores and gas stations - counts as junk food⁴⁰. Many Navajo have personal gardens, where they grow their own vegetables. Navajo also herd sheep for wool, and can use the meat for food. At the Friday market in Ganado, some vendors sell freshly prepared foods. The Hubbel Trading Post is working on 15 acres to restore agricultural activities that historically occurred at the trading post, but it is unclear how the produce grown there will be distributed. The chapter has plans to build a shopping center at Burnside that will include a supermarket; but the timing on this project is undetermined. Currently people generally travel the 25 miles east to St. Michaels or 30 miles east to Window Rock for weekly grocery trips. In other Navajo communities such as Tuba City, the Mormon Church as distributed at no cost, seeds, irrigation equipment, and conducts farming classes.

The RJWF County Health Food Environment ranks Apache County .9 on a scale of 0 to 10 (10 being the best) with regards to factors that contribute to a healthy food environment. This ranking is based on factors such as access and proximity to a grocery store; number of food stores and restaurants; expenditures on fast foods; food and nutrition assistance program participation; food prices; food taxes; and availability of local foods. Navajo County, which borders Apache county on the west, was given a 4.3 ranking. Arizona's overall food environment is ranked 6.9. The highest ranked (and most urban) Arizona county is Maricopa at 7.6⁴¹.

PHYSICAL ACTIVITY

Using data from The National Diabetes Surveillance System, the CDC's Behavioral Risk Factor Surveillance System (BRFSS) and data from the U.S. Census Bureau's Population Estimates Program, 22% of Apache County residents report engaging in leisure time physical activity⁴². This places the county at the median of all Arizona counties. The least active counties are Mohave and La Paz with 31 percent of their populations reporting no leisure time physical activity; 16 percent of Coconino County residents report having no leisure time physical activity.

Figure 16: Ganado/Burnside 911 Calls (2014)



Source: Ganado Fire District. Health related 911 calls only.

EMERGENCY CALL DATA

Using data for 2014 provided by the Ganado Fire Department, accidents on SR264 between Ganado and Burnside can be measured (Figure 16: Ganado/Burnside 911 Calls (2014)). This data only represents fire department calls; the Sage Memorial Hospital also provides emergency services in this area. However, data from Sage was not available. Data on distribution of calls (percent Sage/percent Ganado Fire Department) is also not available.

During 2014, the Ganado Fire Department went on 145 calls. Of those calls 19% were EMS standby calls at school sports events; and the balance, 118 were health related. The following is based on the 118 health related calls.

Sickness

Abdominal pain/sickness was the third highest reason for calls. Other calls, which include a range of topics were the second highest reason for calls. Information from the Indian Health Service for the Fort Defiance District supports these statistics. During the first four months of 2015, 85 calls in this district were for medical assistance (18% of all calls). People using emergency services for sickness could be an indicator of a lack of transportation to the doctor, or a lack of ongoing medical care.

Motor Vehicle Accidents

Motor vehicle accidents with injuries, is the third highest reason for 911 calls. One of the motor vehicle fatalities and two of the motor vehicle injury accidents involved pedestrians. Statewide (urban and rural areas) in Arizona in 2013 (the latest year for which statistics are available), 19 percent of all motor vehicle crashes involved pedestrians⁴³. Along SR264 in 2014, 25 percent (3 out of 12) crashes involved pedestrians. Using data from the Indian Health Service, 2015 emergency calls for the Fort Defiance District were analyzed. During this time, two pedestrians were involved in motor vehicle accidents (location unspecified).

Statewide, 94 of the Arizona 2013 crash victims were Native American⁴⁴. Maricopa and Pima Counties (the two most populous Arizona Counties) account for 80 percent of all crashes; Apache County accounts for less than 1% (.003) percent of the over 2013 vehicle 107,000 Arizona crashes. SR247 between Ganado and Burnside accounts for less than .01% of all State roadways in Apache County⁴⁵. Assuming crash rates stayed relatively constant between 2013 and 2014, motor vehicle crashes along SR264 account for 3 percent of all Apache County crashes, making the number of crashes along this roadway disproportionately high.

A 2001 FHWA analysis of “walking along the roadway” crashes⁴⁶ found that at an increase from 7 to 8 percent in the number of single-parent households results in a 13-percent increase in the likelihood of a location being a crash site. The rate of single family households on the Navajo Nation is twice as high than in Arizona; potentially making this group more likely to experience “walking along the roadway” crashes.

Falls

Falls constitute 7 percent of all calls. The CDC states that among older adults, falls are the leading cause of both fatal and nonfatal injuries⁴⁷. To prevent falls, the CDC recommends exercising regularly. The National Council on Aging 2005 Falls Prevention Plan identifies lower extremity weakness, generalized de-conditioning and poor endurance, musculo-skeletal stiffness and rigidity and some of the primary risk factors for falls. The Council states, “a review of the existing research makes it clear that exercise and physical therapy can be effective measure to help reduce falls and fall-related injuries in older adults.”⁴⁸

Mental Health

Calls related to mental health constitute 15% of all 911 calls (assault/battery, attempted suicide/drug withdrawal). Combined with calls for intoxication, mental health calls constitute 1/3 (34 percent) of all 911 calls to the Ganado Fire Department. Intoxication was the highest reason for 911 calls in Ganado and Burnside along SR264 corridor.

The Sage Community Health Needs Assessment reports that Native Americans are 1.7 times more likely to experience serious psychological distress than non-Hispanic whites⁴⁹, and that suicide was the second leading cause of death for Native Americans between ages of 10 and 34 in 2009. Suicide was the reason for a lower percentage of deaths on the Navajo Nation than in Apache County, but was a higher percentage of a cause for death than in Arizona. Young people age 15 to 24 make up 40% of all suicides on southwest reservations⁵⁰ and the suicide rate for Native American Youth is 3 times the national average and on some reservations, is ten times higher than the national average⁵¹. Native American suicide has gone largely unrecognized until 2009-2010 when suicides in an Apache and Navajo community brought the high rate of Native American Suicide to the forefront. Most tribes, including the Navajo, are focusing on strengthening community ties and knowledge of cultural tradition to combat suicide, and other mental health related diseases such as substance and alcohol abuse⁵².

The Tsehootsooi Medical Center Methamphetamine and Suicide Prevention Initiative (MSPI) uses culture to teach coping skills, build community connectedness, and instill hope and resiliency in those they serve.

By using language, culture and tradition, the Tsehootsooi Medical Center (TMC) MSPI Staff are able to tap into the tremendous strengths already present in the community. Using this strengths-based approach, the MSPI staff members strive to build the protective factors that will help keep those they serve safe from substance abuse and depression.

National Indian Health Board MSPI Program Spotlights.

http://www.nihb.org/behavioral_health/mspi_program_navajo_msp.php. Access Date: September 8, 2015.

HEALTH FACTORS CONSIDERED IN THIS ASSESSMENT

Based on the above research, the following factors were determined to be relevant to the Ganado/Burnside Area Traffic Circulation Study

- | Physical Health | Mental Health | Social Health |
|---|--|--|
| <ul style="list-style-type: none"> • Cardiovascular/
Cerebrovascular Disease • Hypertension • Obesity • Diabetes • Motor Vehicle Accidents | <ul style="list-style-type: none"> • Depression • Alcohol Abuse • Suicide | <ul style="list-style-type: none"> • Sense of Community • Economy • Cultural Traditions |

RECOMMENDATIONS: PUBLIC HEALTH IMPACTS OF CIRCULATION STUDY

PEDESTRIAN FACILITIES

The circulation study recommends several short, medium and long term options improvements to the pedestrian network. These improvements could encourage make it easier for pedestrians to travel within Burnside and Ganado and make the SR264 safer to walk along. The pedestrian facility improvements recommended by the study include:

- Extending, reconstructing and making ADA compliant the sidewalk from SR 264 to the Ganado Chapter House
- Extending the sidewalk on the north (school) side of SR 246 between US191 and the Ganado Middle/Elementary School entrances
- Better maintaining the existing sidewalks along SR264
- Installing marked pedestrian crosswalks at the Pedestrian overpass at the Ganado Middle/Elementary School campus entrance, at the intersection of US191 and SR264, Chapter House road (the road from SR 264 to the Chapter House), and at the intersection of Indian Route 37 and SR 264 (this road leads to several houses and Ganado Lake)
- Creating an asphalt multi use path on the south side (eastbound side) of SR 264
- Adding multi-use paths in Burnside from SR264 connecting community housing between Indian Route 15 to SR264 to these roadways
- Adding to the multi-use path at the Hubble Trading post and connecting it across SR264 to Sage memorial Hospital and the Senior Group Home.

Providing an asphalt surface for all paths along SR264 and within the community will make it easier for older residents to travel within the community and help to prevent falls. In particular, providing an asphalt surface path between the Senior Group home, Sage Memorial Hospital, and the Chapter House, and between the Senior Center and the Chapter House will provide a safe and enjoyable venue for seniors to walk within the community.

Creating an asphalt multi-use path along SR264 between Ganado and Burnside will create a safe pedestrian environment for people walking along the roadway. This could help to reduce injury and deaths of pedestrians due to motor vehicle accidents. SR264 between Ganado and Burnside crosses Ganado Wash. An NDOT project to add sidewalks to the bridge that currently crosses the wash SR264 is planned for 2016. In the future, a separate pedestrian bridge that provides a barrier between cars and pedestrians should be placed over Ganado Wash at SR264. A prefabricated pedestrian bridges can help lower the potential cost of this improvement.

Installing crosswalks at Chapter House Road, the intersection of SR264 and US191, the School Entrance and at Indian Route 37 and SR264 will help to reduce crashes. While Sage Memorial Hospital had indicated that they are going to change their entrance from SR 264 to US 191, pedestrians will still take the shortest route, and either barriers to prevent pedestrians from crossing SR264 at the Sage entrance or additional pedestrian crossings at the entrance to Sage Memorial Hospital on SR264 should be provided until the entrance is moved. Additionally, elders who may choose to walk from the senior center to the hospital would have to walk an additional 400 feet (in addition to the almost 1,000 feet to reach the hospital entrance from SR264 if they were

to use the crosswalk at US191 and SR264. Placing a crosswalk at Chapter House Road and a path to the hospital on the north side of SR264 or directly across the street from the Hospital Entrance, will make the hospital more accessible to seniors and other pedestrians.

The multi-use trail on the south/eastbound side of SR264, provides a safe and attractive pedestrian facility. To make this facility available to people living on the north (westbound) side of SR 264, pedestrian crosswalks (solar activated signals) should be provided at local roads that intersect with SR264 from the north.

The proposed trail to connect the Life Center to Sage Memorial Hospital would require crossing a significant wash, rendering it unusable many times during the year. Conversations with staff at the Life Center revealed that most residents are independently mobile and would like to be able to walk more. A bridge would make this crossing usable throughout the year. Other options could be include:

- Providing a sidewalk or stabilized path along the access road (Indian Route 9201) to the Life Center, and a local circulator stop with shelter at Indian Route 9201 and the Life Center access road, and provide mobility to seniors living there through a local circulator. The Chapter already has several buses that pick up seniors living in other nearby chapters and transport them to the Senior Center for various programs. Turning one of these buses into a local circulator with regular service could allow seniors to be more independent and access the Chapter House, Ganado senior center, hospital, post office, and Friday market on their own schedule.
- Create a new path (stabilized surface or asphalt) directly from the Senior Center to SR264. The road to the Life Center is about one mile; a more direct path to SR264 would be 1/2 mile; and place seniors 1/4 mile closer to the hospital entrance and chapter house.

Enhancing and making ADA accessible the sidewalk between SR264 and the Chapter House will make the Chapter house more accessible to the entire community and could help reduce social isolation of seniors and other in the community. Many seniors from Ganado and other chapters use the Ganado Senior Center, which is close to the Chapter House. Connecting the ADA sidewalk to the Senior Center as well as the Chapter house could provide a place for seniors to safely walk between the Senior Center and Chapter House, and from the Senior Center to the hospital and Friday market. This could help reduce social isolation, and help seniors become more agile and physically fit, ultimately reducing their risk for falling.

The Chapter is currently working on a trail between the Chapter House and the Hubbel Trading Post, and extending the Trail at the Trading Post to SR264. This trail should connect to a marked, signed, and signalized pedestrian crossing at the Trading Post entrance road and SR264. While a pedestrian crossing is planned for the intersection of SR264 and US191 less 1/2 mile east of the Ganado Trading Post road entrance, people wishing to walk west from the trading post to Burnside, or who are coming from residences west of the Trading post will not walk 1/2 mile east to a safe pedestrian crossing (unless marked, signed, pedestrian crosswalks from all of the roads intersecting SR264 from the north are provided).

The Hubbel Trading Post road also crosses Ganado Wash. The proposed realigned road crosses Ganado Wash. When this road is realigned, more people may visit the trading post because it is more accessible and easier to find, and speeds may be higher because the road is not as sinuous. This road also provides access to a small housing subdivision, and several people live at the Trading Post. Sidewalks, designed to be compatible with the historic nature of the trading post, should be provided along this road, and a separate pedestrian bridge should be provided across Ganado Wash.

The multi-use path in Burnside starts at the south entrance of Ganado High School. This entrance is almost 1/3 of a mile from the pedestrian crossing at the Burnside Traffic Circle. Pedestrians will typically walk 1/4 mile to their destination. To limit the potential for pedestrian and vehicle collisions, a pedestrian crossing at the south entrance to the school and the start of the Burnside Pedestrian Path on the east side of Indian Route 15 should be provided. A pedestrian crossing at the south entrance of the school will provide more direct connection between the school and the neighborhood.

In the future, a shopping center is planned at the northwest corner of the Burnside traffic circle. Pedestrian crossings between the high school and the center and the McDonald's and the Center should be provided to reduce the potential for collisions between pedestrians and vehicles.

TRANSIT IMPROVEMENTS

The Circulation Study recommends includes short, medium and long term options for transit improvements including a bus pull-out bay at the Burnside Navajo Transit Stop and bus shelters at school bus and Navajo Transit stops. Ganado and Burnside are located in northern Arizona, which has dry and cold winters. This area of the state is subject to four seasons, and extreme winter weather. While cold weather does not cause colds, bus shelters would protect transit and school bus riders from the elements, and provide a safe place for them to wait for the bus in early morning hours.

The 2014 National Rural Transit Fact book reports that 7% of all rural transit trips nationally are for medical purposes⁵³. Providing a bus stop at the hospital could enable people Using Transit to access Sage Memorial Hospital, which recently has had it's contract extended by IHS.

Twelve percent of all transit trips are taken for recreational reasons⁵⁴. Providing a bus stop at Chapter House Road could enable people to be more engaged in their community, and result in less social isolation. The Chapter House offers several opportunities for youth to participate in traditional activities and be engaged in their community. Enabling children to reach the Chapter House via transit could give them more access to these opportunities and result in more cultural awareness. A planned bus stop in the parking area of the planned shopping center could also increase access to the anticipated grocery store.

A positive correlation between Transit Availability and Transit use exists within rural areas studied as in the National Transit Fact Book. Enhancing bus stops might also increase the number of people willing to take transit. This could increase physical activity because people would either walk from transit to their destination.

Figure 17: National Transit Livability Statistics

	Transit Availability	Transit Accessibility	Transit Use	Transit Use to Availability	Transit Desirability	Transit to Work	Vehicle Availability
National	57%	6:06	20%	0.35	5%	3%	94%
MSA-City Center	86%	5:15	28%	0.33	8%	4%	87%
MSA- Suburban	66%	6:36	15%	0.23	5%	4%	96%
MSA-Rural	22%	8:24	9%	0.41	2%	3%	98%
Small Urban	37%	5:55	10%	0.27	1%	4%	94%
Rural	13%	8:11	9%	0.69	0%	3%	97%

Source: National 2014 Transit Fact Book, PLAN*et

The 2014 National Rural Transit Fact statistics on National Transit Livability show that while transit is often further and less available in rural communities, the ratio of people taking transit to it's availability in rural areas is actually almost two times higher than it is in urban areas; despite the fact that rural areas have a higher percentage of vehicle availability. (Figure 17: National Transit Livability Statistics and Ratio of Transit Availability to Transit Use). This speaks to the importance of transit in rural areas, and reflect that while transit may not be as available to people in rural areas, it is as important to them as a mode of transit. One way to make transit more accessible to people in Ganado in Burnside would be to make it more accessible by providing additional transit stops.

SAFETY IMPROVEMENTS

Many of the safety improvements recommended in the Circulation Study reduce the risk of collisions between pedestrians and vehicles. During the past year, three pedestrian vehicle crashes have occurred along SR264, making pedestrian safety and important consideration for community health. The safety improvements recommended by the study include short, medium and long term options.

Those relevant to health include:

- Installing street lighting:
 - In front of the Ganado High School and at the Burnside traffic circle and approach to the traffic circle
 - Along SR264 between Chapter House Road and the entrance to the Ganado Middle/Elementary School campus
 - Along US191 from Chapter House Road across 264 along Post Office Road to the intersection of Round Top/Trading Post Road with Indian Route 420 (behind the Middle/Elementary School campus)
- Installing traffic warning signs for school bus stops, intersections, and stop signs along SR264 and US 191 in Ganado
- Installing bus stop warning signs at school bus stops along SR264 and US191 in Ganado

- Reducing speed limits to 35 mph on SR264 in Ganado between Chapter House Road and Indian Route 37 and along Indian Route 37 to Ganado Lake
- Establishing 20 mph school zones on Indian Route 15 in front of Ganado High School and on SR264 in front of the Ganado Elementary Middle School Campus
- Providing a stop light or traffic circle at the intersection of SR264 and US191 in Ganado
- Installing traffic calming such as pavement markings, rumble strips, gateways, flashing speed signs, center islands, pedestrian activated signals, or speed tables at pedestrian crossings/speed transition zones.

Providing street lighting at places people walk would increase pedestrian safety and potentially reduce pedestrian vehicle collisions. Almost half of the motor vehicle accidents along SR264 occur in the evening or during dawn or dusk. Two of the three pedestrian vehicle crashes occurred after sunset.

Installing bus stop warning signs could increase safety for school children when they wait for the bus and when the bus drops them off. The Uniform Manual on Traffic Control Devices, chapter 7 states should be installed in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible to road users for a distance of 150 m (500 ft) in advance and where there is no opportunity to relocate the bus stop to provide 150 m (500 ft) of visibility. Currently, school children either cross in front of the stopped bus on SR264 when they are dropped off after school. Since traffic is not permitted to pass a stopped bus, the bus becomes a traffic signal. School bus stops along SR264 are unmarked. A steep hill marks the entrance to Ganado. While the bus is likely visible to people coming into Ganado, speeds along the roadway are high and drivers may not expect school buses to be stopped or children to be crossing the road. Providing a warning sign for drivers can alert them to these facts and prepare them to stop for school buses and children crossing the road.

School speed zones and reduced speeds, with effective enforcement, can be an effective way of reducing the number and severity of crashes along SR264. The Institute of Transportation Engineers (ITE) Safe Routes To School Briefing Sheet⁵⁵ states that five percent of pedestrians are fatally injured when struck by a vehicle traveling at 20 mph or less. This compares with fatality rates of 40, 80, and nearly 100 percent when the pedestrian is struck at 30, 40, and 50 mph or more, respectively. The ITE also states that applying a combination of traffic control and enforcement measures in conjunction with a reduced speed limit is more likely to slow traffic. Some of the tools identified by the ITE include police enforcement (for example, conventional, automated speed cameras, double fines), public awareness campaigns, and engineering countermeasures. Traffic engineering tools include speed limit zones and traffic calming (such as curb extensions or raised crosswalks).

Traffic calming measures can also help reduce speeds and enhance driver awareness. The Federal Highway Administration (FHWA) states, "a more permanent way to reinforce the need to reduce speed is to change the look and feel of the road by installing traffic calming treatments that communicate to drivers that the function of the roadway is changing⁵⁶". The FHWA evaluated a variety of traffic calming tools on rural roadways where there was limited police enforcement.

Figure18: Summary Of Impacts And Costs Of Rural Traffic Calming Treatments

Treatment	Change in 85th Percentile speed (mi/h)	Cost	Maintenance	Application
Transverse pavement markings	-2 to 0	\$	Regular painting	Community entrance
Transverse pavement markings with speed feedback signs	-7 to -3	\$\$\$	Regular painting	Community entrance
Lane narrowing using painted center island and edge marking	-3 to +4	\$	Regular painting	Entrance or within community
Converging chevrons and "25 MPH" pavement markings	-4 to 0	\$	Regular painting	Community entrance
Lane narrowing using shoulder markings and "25 MPH" pavement legend	-2 to 4	\$	Regular painting	Entrance or within community
Speed table	-5 to -4	\$\$	Regular painting	Within community
Lane narrowing with center island using tubular markers	-3 to 0	\$\$\$	Tubes often struck needing replacement	Within community
Speed feedback sign (3-months after only)	-7	\$\$\$	Troubleshooting electronics	Entrance or within community
"SLOW" pavement legend	-2 to 3	\$	Regular painting	Entrance or within community
"35 MPH" pavement legend with red background	-9 to 0	\$	Background faded quickly; accelerated repainting cycle	Entrance or within community

LEGEND:

\$ Under \$2,500 ; \$\$ \$2,500 to \$5,000; \$\$\$ \$5,000 to \$12,000

Source: Federal Highway Administration Publication No. FHWA-HRT-08-067. February 2009.

The study found that speed tables, speed feedback signs, vertical markers that narrowed travel lanes, and speed limit markings with a red background on the street were most effective in reducing speeds (Figure 18: Summary of Impacts And Costs Of Rural Traffic Calming Treatments).

ROADWAY CAPACITY IMPROVEMENTS

The Study recommends long, medium, and short term actions to improve the efficiency and capacity of the roadway. This assessment focuses on the impact of these changes to the potential safety of pedestrians and motorists.

These include:

SR264 between Chapter House Road and the Burnside Traffic Circle and east of Indian 420.

- Creating Providing eight foot paved shoulders and a 15 foot buffer between the pedestrian path and the current roadway. In the long term, the shoulders and buffer area would be used to provide an additional travel lane and eight foot shoulder (12 foot travel lane, eight foot shoulder, three foot buffer area) in each direction. (Mid term).
- Widening the roadway to four lanes in each direction, with a center turn lane, eight foot paved shoulders, and a three foot separation between the pedestrian path and the roadway.

The short and mid term recommendations provide ample distance between the pedestrian and the vehicle and provide a safe walkway for pedestrians along SR264 between Burnside and Ganado. The shoulders also provide safe pull off zones, potentially reducing the number of crashes between vehicles.

The long term recommendations will result in reducing the separation between vehicles and the roadway to three feet or less and may reduce the effectiveness of the mid-term improvements and make the roadway less safe. Three feet is a minimum distance to buffer pedestrians from streets and should only be considered in low speed areas. The three foot buffer will provide adequate space for large vegetation that would provide vertical protection from vehicles for pedestrians.

Natural landscaping is anticipated for the buffer area. Ganado and Burnside are high desert. The predominant vegetation in this area is sagebrush, which is low will not provide an effective barrier between a pedestrian and moving car that leaves the roadway. More vertical vegetation, such as pinon is very slow growing and requires maintenance. Lacking vegetation solutions, a wide buffer between the pedestrian and moving traffic can help eliminate pedestrian/vehicle crashes.

The presence of a paved shoulder to separate pedestrians from vehicles will not prevent accidents. A 2001 FHWA Analysis of Factors Contributing to "Walking Along Roadway" crashes found that 60% of crashes on rural highways occurred with the presence of a paved shoulder. This analysis also found that an unpaved shoulder of or more makes a location 89 percent less likely to be a crash site. This is consistent with the conceptual reasoning on this variable and suggests that such sites have adequate walking space and are less in need of sidewalks than sites with less than 1.2 m (4 ft) of walkable unpaved space⁵⁷. Instead of providing a paved shoulder, a wide unpaved shoulder could contribute to accident reduction. Another options could be providing a 4' paved, with rumble strip and 4' unpaved shoulder. This could provide an area for pull-offs and snow storage, and contribute to a reduction in crashes.

SR264 between Chapter House Road and Indian Route 420

- One 12 foot vehicle lane in each direction with six to eight foot sidewalks, no shoulder, vertical curb, and pedestrian street lights. (Short to mid term).
- Widening the roadway to four 12 foot lanes in each direction with a center turn lane, three foot separation between the pedestrian path and the roadway, and pedestrian and roadway streetlights.

Streetlights in this area should make the area safer for pedestrians and make drivers aware they are within a more populated area. The the pedestrian walkway and the roadway should be lit with separate fixtures.

Manual on Uniform Traffic Control Devices (MUTCD) section on pedestrian and worker safety states, "It has been determined through study and experience that vertical curbs cannot prevent vehicle intrusions onto sidewalks.⁵⁸" While vehicular speeds are planned to be slowed in this area, a vertical curb should not be relied upon to prevent collisions between pedestrians and vehicles. The FHWA recommends a minimum 3' separation between pedestrians and vehicles. A buffer with or vertical barrier such as street trees could provide an effective way to reduce pedestrian and vehicle crashes. It would also provide a sense of place to this area, which is the center of Ganado.

US 191 from Chapter House Road to Round Top/Trading Post Road to Indian Route 420 intersection with SR 264 AND on US 192 in Burnside in front of Ganado High School to the north entrance to the McDonald's AND from the intersection of the dirt road 1 mile south of SR264 to Chapter House Road:

- Paving the road (Ganado). (Mid to long term).
- Providing two 12 foot vehicle lanes and optional six to eight foot sidewalks (no buffer) and pedestrian lighting. (Mid to long term).

Paving the road will make destinations such as the post office, market, and convenience store more accessible to people living on the north side of SR264 in Ganado. Pedestrian lighting will make the areas safer. Once the roads are paved, they may experience more use and higher speeds. To protect pedestrians along these roadways, lit sidewalks, separated from the roadway with horizontal and vertical buffers, should be installed.

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6. Recommendations

INTRODUCTION

This chapter includes recommendations regarding the facilities recommended in the Area Traffic Circulation Study relevant to individual and community health.

RECOMMENDATIONS

Overall, the study recommendations will help make travel in Ganado and Burnside safer and may contribute to an increase in important health determinants including physical activity, mobility options, and a better sense of community. (Figure 19:Recommendations).



Community members provide ideas on Healthy Transportation at a public meeting held in May, 2015.

Recommendations contained in the Area Traffic Circulation Study mostly pertain to actions that could be undertaken by ADOT or NDOT. This HIA includes recommendations that could be implemented by these and other agencies, including the Chapter, Sage Memorial Hospital, and other entities in partnership with ADOT, the Navajo Nation, or the Chapter.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
3, 9, 10, 11, 13, 14	Asphalt or concrete surfaces on all paths along SR264	This will create an even all-weather walking surface, removed from the roadway, that can be shoveled and salted when it snows. This could increase the number of people who walk, connect community destinations including the chapter house, hospital, and Friday Market, and increase access to community services and events. A stable surface will help to reduce falls, and make it easier for elders to walk within the community. A 4-mile stable surface can also be used by residents as a running track, helping to keep alive this cultural tradition.
5, 7, 13, 14	Marked pedestrian crosswalks and wireless solar pedestrian signs at Chapter House Road, the intersection of SR264 and US191, the School Entrance, the Hubbel Trading Post entry (if marked pedestrian crosswalks not provided from roads intersecting SR264 from the north), and at Indian Route 37 and SR264 will help to reduce crashes.	Increases pedestrian safety and reduces collisions between people and vehicles. As a result, more children may walk to and from the bus stop (instead of their parents driving them), and more people may be able to walk from the Senior Center to the hospital.

FIGURE 19: RECOMMENDATIONS		
PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
5, 13	Marked pedestrian crosswalks with solar activated signals) at local roads that intersect from the north with SR264	The sidewalk is planned for the south side of SR264. Many people live along rural roads north of SR264 and use these roads to walk to SR264. Increasing pedestrian safety can reduce collisions between people and vehicles. More children may walk to and from the bus stop (instead of their parents driving them).
5, 6, 11, 13, 14	A sidewalk along the senior housing access road Indian Route 9201, and a bus stop with shelter at Indian Route 9201 and the senior housing access road, and provide mobility to seniors living there through a local circulator	This will provide additional transportation options to the residents at the Life Center Senior Group home are independently mobile. Now they rely on ADOT supplied vans to bring them to and from destinations. This will provide a way for seniors to be less isolated and to independently access the hospital, senior center, chapter house, Friday market, and community services.
7, 9, 13	An enhanced and ADA accessible sidewalk between SR264 and the Chapter House (as recommended in study) and (additional recommendation) connect this sidewalk to the Senior Center and the Chapter house.	This will enable seniors and others to be removed from the roadway when they walk from the senior center to other locations within Ganado and access transit (should a transit stop be placed on SR264 at this location).
5	A marked pedestrian crossing and solar activated signal at the south entrance to the school and the start of the Burnside Pedestrian Path on the east side of Indian Route 15.	This will protect people walking from the subdivision on the east side of Indian Route 15 to school from collisions. As a result, more people may walk to and from school, instead of driving across the road.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
5	Pedestrian crossings between the high school and the center and the McDonald's and the planned shopping center.	After school, many students walk to the Mc Donalds and once the shopping center is constructed, will likely walk to it. This will help to reduce the potential for collisions between pedestrians and vehicles at the Ganado High School
13	Street lighting between Chapter House Road and Indian Route 420, along US191 from Chapter House Road to SR264, and along Round Top/Trading Post Road and Indian Route 420 to its intersection with SR264 (as recommended in the study)	During winter months, it becomes dark by 5:00 p.m. and stays dark until about 7:00 a.m. This will make pedestrians visible along SR264 in Ganado, where many people walk to access the local convenience store, post office, and schools. Should help to reduce collisions between pedestrians and vehicles.
5	Solar activated bus stop warning signs at all bus stops on SR 264 and US 191 (as recommended in the study)	Currently, there are no signs for school bus stops or areas to wait for the school bus. Parents park alongside the two lane road (which has no shoulder), and other drivers along SR264 and US191 traveling at speeds in excess of 50 mph come upon buses and parked cars with no warning. This will help to reduce collisions between vehicles and vehicles and pedestrians.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
5	School speed zones and reduced speeds supported by a combination of traffic control and enforcement measures that could include conventional police surveillance and traffic calming	The entrance to Ganado Elementary and Middle Schools and the High School are along high speed roadways. Subdivisions, where students live are across these busy streets. This will help protect students from being hit by cars as they cross the road going to and from school, and potentially encourage more children to walk to school because it is safer to cross the road.
5	<p>Speed tables, speed feedback signs, vertical markers that narrowed travel lanes, and speed limit markings painted on the road on a red background on:</p> <ul style="list-style-type: none"> • SR264 Between Indian Route 420 and Chapter House Road • On SR 264 from the Burnside Traffic Circle East past the Giant convenience store • On US191 from Chapter House Road to SR264 • On US191 from Indian Route 15 from the south entrance of the Ganado High School to one mile north of the Burnside Traffic Circle. 	Many people walk in Ganado and Burnside and between the two communities. Traffic calming will reduce speeds and provide more time to react to pedestrians and other roadway obstacles (such as tumbleweed, ice in the winter, and rain in the fall and spring). This will make roadways safer and reduce crashes.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
5	When SR264 is widened to four lanes, a four foot wide, paved with rumble strip and four foot wide, unpaved shoulder along both sides of SR264 (long term)	A rough surface is more effective than a paved shoulder to make a driver aware that they are leaving the travel lane. However, a paved shoulder adds to roadway safety by allowing disabled cars to pull off the road, and provides a place for bicycles. This solution provides both of these safety solutions, while keeping a wide buffer between the sidewalk and travel lanes. This increases pedestrian safety.
5. 9	Until SR264 is widened to four lanes, a paved pedestrian path on both sides of SR264 with a 15 foot wide buffer zone (as recommended in the study)	This provides a safe, level place for people to walk that is removed from the travel lanes. Adequate space between the path and travel lanes exist should a vehicle leave the roadway.
5. 13	In all areas where lighting is recommended, separate pedestrian and roadway lighting fixtures, or lighting fixtures that are designed to illuminate the pedestrian and roadway areas	This will illuminate the pedestrian areas making them safer to navigate during dawn, dusk, and night. Helps to prevent falls. If people perceive the sidewalks as safe at night, they may use them more.
3. 5. 9. 13	A minimum three foot buffer and vertical curb separating the pedestrian and vehicular travel ways on Round Top/ Trading Post Road and Indian Route 420 to the intersection with SR264	Several important community destinations are along this road including the post office, middle and elementary schools, and Friday Market. Placing sidewalks on this road will make it easier to move around the community by connecting these and other destinations to other destinations connected by sidewalks in the community, remove pedestrians from the roadway, and make it safer for them.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
4, 5	A buffer between the sidewalk and roadway with or vertical barrier such as street trees on SR264 between Chapter House Road and Indian Route 420	Vertical barriers are effective in protecting pedestrians from cars that leave travel lanes. This makes the roadway safer for pedestrians. Vertical barriers can be trees, art, or decorative walls or fencing that can enhance the appearance of a community. When a community is attractive, residents take pride in it.
5, 9	Sidewalks and a separate pedestrian bridge over Ganado Wash along the road to the Hubbel Trading Post	The road to the Hubbel Trading post is used by tourists, residents, and people who work at the trading post. Placing sidewalks on this road will remove pedestrians from the roadway, and make it safer for them.
5, 13	A separate pedestrian bridge over the Ganado Wash at SR264	NDOT is placing five foot sidewalks on the bridge over Ganado Wash. A five foot sidewalk is too narrow for people to walk side by side. Elders or children who may need assistance would be safer if they could walk on a separate facility, especially during winter months, when bridges freeze before roadways.
6, 7, 8, 12, 13, 15	Provide additional transit stops at: <ul style="list-style-type: none"> • Chapter House Road and SR264 • Sage Memorial Hospital entrance • The planned shopping center. 	Making transit more accessible will enhance access to community services and events, and make it easier for enable people to reach employment and/or the supermarket in St. Michaels, so they could buy healthier food.

FIGURE 19: RECOMMENDATIONS

PATHWAY/ HEALTH DETERMINANT	RECOMMENDATION	RATIONALE
6, 13	Enhance bus and circulator stops with shelters and lighting (as recommended in the study)	Making transit safer and more comfortable will encourage more people to use transit instead of waiting for someone with a car, or driving themselves.
7, 8, 12, 13, 14, 15	Provide a local circulator connecting senior center, schools, hospital, senior group homes, chapter house, and bus stops	A local circulator runs more frequently than a bus and enables people to move around the community without cars. More frequent transit service may increase the number of people using it, and can help residents access services at the hospital and services and community events at the chapter house, helping them to feel more connected to the community.

7. REPORTING

INTRODUCTION

This chapter describes how the results of this assessment are disseminated to entities that will be responsible for implementation of the School Playground project. The primary mode to report the results of this study includes presentations to the PARA Technical Advisory Committee, the Ganado Chapter Council, and inclusion of this study in the PARA Study.

PRESENTATIONS

Presentations related to this study are shown in (Figure 20: Reporting). In addition, a web page soliciting input was created. The intent of the web page was to reach younger residents. Despite fliers, face to face contact, and promotion on the Chapter Facebook page, the web page was not used by the community. The most effective forms of outreach were the face-to-face surveys and one-on-one meetings.

Figure 20: Reporting			
Entity	Date(s)	Reporting By	Presented Topics
Technical Advisory Committee	2/11/2015 5/21/2015	PLAN*et Communities	About HIA Healthy Transportation and Scoping
Elders Lunch	4/23/2014	PLAN*et Communities	About HIA Healthy Transportation/ Solicit input
Project Advisory Committee Meetings	Monthly	PLAN*et Communities	Project Coordination
Stakeholder Meetings	4/23 and 4/24 2015	PLAN*et Communities	About HIA Healthy Transportation/ Solicit input

Figure 20: Reporting

Entity	Date(s)	Reporting By	Presented Topics
Interviews/Survey	4/23/2015	PLAN*et Communities	About HIA Healthy Transportation/ Solicit input
Community Meeting	5/27/2015	PLAN*et Communities	About HIA Healthy Transportation/ Solicit input
Chapter Council Meeting	October 2015	PLAN*et Communities	About HIA/Final Recommendations

IMPLEMENTATION ENTITIES

The primary entity responsible for transportation improvements in Ganado and Burnside are ADOT through the Apache District II, and the Navajo Department of Transportation (NDOT). Some funding for Dial-A-Ride could come through the Northern Arizona Council of Governments (NACOG) or various Navajo Nation Departments. These entities are included in the Area Traffic Circulation Study Stakeholder Committee.

Technical Advisory Committee

The study is guided by a Technical Advisory Committee (TAC). The role of the TAC is to provide guidance, support, advice, suggestions, recommendations, and to perform document reviews throughout the study process. TAC members include representatives from:

- Apache County District II
- Ganado Chapter
- Ganado Chapter Farm Board
- Ganado Chapter Planning Department
- Ganado Unified School District
- Ganado Fire District
- BIA Fort Defiance Agency
- Navajo Transit System
- Navajo Nation Division of Transportation
- Navajo Nation Division of Economic Development
- Navajo Nation Division of Community Development
- Navajo Nation Division of Public Safety
- Navajo Nation Division of Agriculture
- Navajo Nation Historic Preservation Office
- Sage Memorial Hospital
- Indian Health Service
- Arizona Department of Health Services
- FHWA Arizona Division
- ADOT Flagstaff District Office
- North Arizona Council of Governments (NACOG)
- ADOT Holbrook Engineering District
- ADOT Multimodal Planning Division

8. Monitoring and Evaluation

MONITORING AND EVALUATION

This chapter includes identification of indicators that can be used to monitor and evaluate implementation of HIA recommendations; and an discussion of the efficacy of the HIA process.

MONITORING AND EVALUATION: HIA RECOMMENDATIONS

Figure 21: Implementation Responsibility and Timing identifies indicators that can be used to measure the efficacy of recommendations contained in this HIA, the entities that could collect data for the indicator, and how the data could be collected (implementation methodology).

Figure 21: Implementation Responsibility And Timing					
Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
3, 9, 10, 11, 13, 14	Asphalt or concrete surfaces on all paths along SR264	Increase in elders walking for socializing and to hospital	Ganado IHS Community Health Nurse	Community Health Nurse Interviews	Now
			Sage Memorial Hospital	Surveys through annual Hospital Health Assessments	Annual

Figure 21: Implementation Responsibility And Timing					
Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
5, 7, 13,14	Marked pedestrian crosswalks and wireless solar pedestrian signs.	Increase in children walking to school Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Start with installation of crosswalks and signs. Monitor through regular emergency call reporting	ASAP
5, 6, 11, 13	A sidewalk along the senior housing access road Indian Route 9201, and a bus stop with shelter at Indian Route 9201 and the senior housing access road, and provide mobility to seniors living there through a local circulator	Increased Independent Travel	Group Home Senior Center	Trip log that is maintained now and after sidewalk completed and circulator service is provided	Now
7, 9, 13	An enhanced and ADA accessible sidewalk between SR264 and the Chapter House (as recommended in study) and (additional recommendation) connect this sidewalk to the Senior Center and the Chapter house.	Increased participation in Chapter activities	Chapter Administrator	Participation lists of Chapter Activities identifying participation, mode of travel, and age	Now

Figure 21: Implementation Responsibility And Timing

Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
5	A marked pedestrian crossing and solar activated signal at the south entrance to the school and the start of the Burnside Pedestrian Path on the east side of Indian Route 15.	Increase in children walking to school Decrease in motor vehicle/ pedestrian crashes	Ganado HS Sage Memorial EMS Ganado Fire Department	Start with installation of crosswalks and signs Student travel statistics Monitor through regular emergency call reporting	ASAP
5	Pedestrian crossings between the high school and the center and the McDonald's and the Center should be provided to reduce the potential for collisions between pedestrians and vehicles.	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS Ganado Fire Department	Start with installation of crosswalks and signs. Monitor through regular emergency call reporting	ASAP
13	Street lighting	Decrease in motor vehicle/ pedestrian crashes Reduction in violent crime	Ganado Fire Department Sage Memorial EMS Navajo Police	Monitor through regular emergency call reporting	ASAP

Figure 21: Implementation Responsibility And Timing					
Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
5	Solar activated bus stop warning signs	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Start with installation of crosswalks and signs.	ASAP
				Monitor through regular emergency call reporting	ASAP
5	School speed zones and reduced speeds supported by combination of traffic control and enforcement measures	Reduced speeding	Navajo Police	Speeding Tickets	ASAP
5	Speed tables, speed feedback signs, vertical markers that narrowed travel lanes, and speed limit markings painted on the road on a red background	Reduced speeding	Navajo Police	Speeding Tickets	Now
		Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now
5	When SR264 is widened to four lanes, a four foot wide, paved with rumble strip and four foot wide, unpaved shoulder along both sides of SR264 (long term).	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now

Figure 21: Implementation Responsibility And Timing

Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
5	Until SR264 is widened to four lanes, a paved pedestrian path on both sides of SR264 with a 15 foot wide buffer zone (as recommended in the study)	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now
5. 13	Separate pedestrian and roadway lighting fixtures, or lighting fixtures that are designed to illuminate the pedestrian and roadway areas	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now
5. 9	Sidewalks and a separate pedestrian bridge over Ganado Wash along the road to the Hubbel Trading Post	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now
5. 13	A separate pedestrian bridge over the Ganado Wash at SR264	Decrease in motor vehicle/ pedestrian crashes	Ganado Fire Department Sage Memorial EMS	Monitor through regular emergency call reporting	Now

Figure 21: Implementation Responsibility And Timing					
Pathway	Recommendation	Indicator	Responsible Entity	Implementation Methodology	Timing
3, 5, 9, 13	A minimum three foot buffer and vertical curb separating the pedestrian and vehicular travel ways on Round Top/Trading Post Road and Indian Route 420 to the intersection with SR264	<p>Decrease in motor vehicle/ pedestrian crashes</p> <p>Increase in pedestrian activity</p> <p>Increased activity at the Friday Market</p>	<p>Ganado Fire Department</p> <p>Sage Memorial EMS</p> <p>Community Health Nurse</p> <p>More merchants at the Friday market</p>	<p>Monitor through regular emergency call reporting</p> <p>Surveys through annual Hospital Health Assessments</p> <p>Community Health Nurse Interviews</p> <p>Monthly observation by Chapter Administrator</p>	Now
6, 7, 8, 12, 13, 15	Provide additional transit stops	Ridership increases	Navajo Transit	Ridership counts	Now
6, 13	Enhance bus and circulator stops with shelters and lighting (as recommended in the study)	Ridership increases	Navajo Transit	Ridership counts	ASAP

It is understood that many of these recommendations are dependent on funding. However, monitoring to evaluate the impacts of these recommendations should be started now, so changes in community health can be measured.

IMPACT EVALUATION

As an HIA is implemented, and if baseline information is established, it can be monitored and over time, the effectiveness of its recommendations can be evaluated. At the conclusion of an HIA, the assessment process can be also be evaluated.

MEETING OBJECTIVES OF HIA

The primary objective of this HIA was to provide information to the Arizona Department of Transportation and Arizona Communities about healthy transportation options and the health impacts of potential transportation improvements recommended through its Planning Assistance to Rural Areas Program. This objective was met.

EVALUATING THE IMPACT OF AN HIA

Evaluating the impact of an HIA includes asking the following questions:

- How and when were the recommendations accepted and implemented by the decision makers – and what factors contributed to this?
- What are the likely reasons why recommendations were rejected?
- Were the aims and objectives of the HIA met?
- What other impacts were associated with the HIA?

A secondary objective of the HIA was to build community partnerships and support for the implementation of these recommendations. This objective has not been met. The PARA process is not designed to build partnerships for implementation, as ADOT or local transportation entities manage project implementation. As a result, agency considerations, such as cost and current policy, dictate final recommendations. As a result, may recommendations that would impact health add to project cost or are not in conformance with current agency policy, and will not be implemented.

ACCEPTANCE OF RECOMMENDATIONS

Due to timing considerations between the development of the HIA and the development of recommendations for the PARA, the recommendations of this HIA have not yet been presented to the tribal council, PARA Technical Advisory Committee or at a community meeting.

OTHER IMPACTS/OUTCOMES

- HIA recommendations under consideration by the PARA consultant for incorporating into the Circulation Study
- Increased awareness at the Chapter about the relationship between transportation and community health
- Increased awareness at the Chapter about community health issues

PROCESS EVALUATION

RESOURCES

This HIA was funded by the Arizona Department of Health Services through a CDC grant. This HIA was part of a pilot project to evaluate A rapid HIA process was used to develop this HIA. The HIA was conducted towards the end of the school year. The determination to conduct this HIA was made by the Arizona Department of Health Services based on a request by the Miami School District.

The HIA was conducted by a consultant working with ADOT and its consultants as they developed the circulation study for Ganado and Burnside. The circulation study timing dictated the timing of this project. Working with the PARA consultant provided some information about mobility that was not considered by the consultant. For example, cattle guards made it difficult for pedestrians to access SR264, and as a result, the PARA consultant included recommendations regarding this in its report. Conversely, many recommendations that would benefit community health add cost to the project and were not supported by the PARA consultant because it believed ADOT would not agree to including them in its study.

EVALUATING THE HIA PROCESS

Process evaluation can provide lessons about why and how the HIA worked, including:

- How was the HIA undertaken?
- What resources were used, and what was the associated opportunity cost?
- What evidence was used, and how did it inform the development of recommendations?
- How were health inequalities assessed?
- How were recommendations formulated and prioritized (what factors influenced this decision-making process)?
- How were the decision makers involved and engaged in the process, what were their expectations, and were they fulfilled with the limited resources available?
- How and when were the recommendations delivered to the relevant decision makers?
- What did those involved in the HIA think about the process used?

AVAILABILITY AND QUALITY OF DATA

There is limited health data available for the Chapter and Apache County. When possible, data specific to the Navajo was used, as well as other data from the Chapter. The Sage Memorial Hospital Health Assessment provided little data. Data collected by the Navajo Tribe is hard to locate and divided among many different entities. A tribal demographic report, census data, data collected by the Chapter and county-wide data was used to identify health inequalities.

PUBLIC ENGAGEMENT

Public meetings were sparsely attended, despite being widely advertised. The most effective forms of public engagement were found to be one-on-one interviews, visits at other meetings and events (such as the health fair), and face to face surveys. Additionally, visiting tribal department representatives was an effective way to secure tribal statistics.

FORMULATION OF RECOMMENDATIONS

Recommendations were based on the Health Assessment and studies of the efficacy of various transportation facilities and actions to reduce fatalities. The Navajo already walk and running is part of their culture.

The recommendations in this HIA were delivered to decision makers through the Project Management Team, the Technical Advisory Committee, and a presentation to the Chapter Council.

PROCESS EFFICACY

No documentation or surveys were conducted to formally assess the effectiveness of the HIA process.

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PARA funds are limited to planning applications and may not be used for the design or construction of transportation facilities. PARA funds may be applied to address a broad range of planning issues related to roadway and non-motorized transportation modes. Funds may also be applied to studies dedicated solely to the planning of public transportation services, for planning studies that address the needs of multiple jurisdictions, or for needs that are limited to neighborhoods within jurisdictions.

Each year, jurisdictions are selected to participate in the PARA program based on applications submitted to ADOT. This project is funded through a The Planning Assistance for Rural Areas (PARA) program is sponsored by the Arizona Department of Transportation Multimodal Planning Division (MPD) and provides federal funds to assist tribal governments and counties, cities and towns located outside Transportation Management Area (TMA) planning boundaries with multimodal transportation planning needs.

PARA funds are limited to planning applications and may not be used for the design or construction of transportation facilities. PARA funds may be applied to address a broad range of planning issues related to roadway and nonmotorized transportation modes. Funds may also be applied to studies dedicated solely to the planning of public transportation services.

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Appendix A

The Relationship Between Health and Transportation

Physical activity is a key determinant of health. The more active an individual, the less likely she or he is to experience chronic obesity related diseases. The CDC states that physical activity doesn't need to be very strenuous for an individual to reap significant health benefits. Even small increases in light to moderate activity, equivalent to walking for about 30 minutes a day, will produce measurable benefits among those who are least active. One of the easiest ways to increase how much we walk is to change our travel behavior from automobile dependent to automobile-independent.

Over the past decades, community and transportation planners have begun to focus on the symbiotic relationship between community design and transportation. This focus has resulted in a shift from communities that offered few mobility choices to communities that provide non-motorized, transit-based, and automobile options. According to the Center for Disease Control and Prevention (CDC), Physical activity also helps you stay at a healthy weight, reduce stress, sleep better, and feel better overall, according to U.S. Health and Human Services guidelines. This is important because the National Health Interview Survey indicates that 53 percent of adult men and 64 percent of adult women never get more than 10 minutes of vigorous physical activity per week.

Communities that provide safe, convenient, and comfortable transportation choices enable people to choose a transportation mode that is appropriate to trip distance and other conditions, such as weather, time allotted for the trip, and the surrounding environment. Studies have shown that communities that offer healthy transportation options correlate with lower rates of obesity and other chronic disease.

A 2009 Robert Wood Johnson Foundation study¹ on the link between transportation, physical activity and obesity includes these findings:

- Most studies of children and adolescents indicate that walking or bicycling to school is related to higher physical activity
- More and better-quality sidewalks are associated with adults having both higher rates of walking and of meeting physical activity recommendations, and with a lower likelihood of being overweight. Similarly, the presence of bicycle lanes and paths is positively related to cycling,⁶⁵ and to more adults meeting physical activity recommendations.

- A survey of more than 11,500 participants in 11 countries found that residents of neighborhoods with sidewalks on most streets were 47 percent more likely to get moderate-to-vigorous physical activity at least five days per week for at least 30 minutes each day than were residents of neighborhoods with sidewalks on few or no streets. A review of 16 studies found that people who reported having access to sidewalks were 20 percent more likely to be physically active than those reporting no access to sidewalks.
- The health benefits of regular physical activity are far-reaching: reduced risk of coronary heart disease, stroke, diabetes, and other chronic diseases; lower health care costs; and improved quality of life for people of all ages. Regular exercise provides the opportunity for health benefits for older adults such as a stronger heart, a more positive mental outlook, and an increased chance of remaining indefinitely independent—a benefit that will become increasingly important as our population ages in the coming years.
- Building multi-use trails can lead to short- and long-term increases in walking and cycling. Furthermore, trails have been shown to be particularly beneficial in promoting physical activity among women and people in lower-income areas.
- With few exceptions, living near trails or having trails in one's neighborhood has been associated with people being 50 percent more likely to meet physical activity guidelines and 73 percent to 80 percent more likely to bicycle. In a nationally representative study, individuals who reported using trails at least once per week were twice as likely to meet physical activity recommendations as were those who reported using trails rarely or never.
- In a sample of pre-adolescent girls, proximity to trails was related to 4.8 percent more physical activity and a 1.4 percent lower body mass index.

The study concludes that:

- A substantial body of research shows that certain aspects of the transportation infrastructure—public transit, greenways and trails, sidewalks and safe street crossings near schools, bicycle paths, traffic-calming devices, and sidewalks that connect schools and homes to destinations—are associated with more walking and bicycling, greater physical activity and lower obesity rates.
- Beyond improving local travel options, transportation infrastructure investments that support physical activity can result in increased recreational opportunities, improvements to individuals' health and decreased health care costs. In combination with infrastructure investments, programs that raise awareness and complement pedestrian and bicycle facilities are promising options for supporting physical activity. Specifically, Safe Routes to School programs and the management of traffic in local neighborhoods and around schools have been shown to affect physical activity among children, adolescents and adults.
- Fast vehicle traffic is a significant barrier and danger to bicyclists and pedestrians. Measures to slow down traffic and to help pedestrians negotiate busy streets can be effective in increasing physical activity and improving safety.
- Addressing the decades-long decline in walking and bicycling for transportation requires changing the physical characteristics of our communities. Federal, state and local policies and funding that support the type of infrastructure investments and programs identified in this brief can help slow and perhaps even reverse this decline.

NOTES:

(Active Living Research Active Transportation. Research Brief 9/09/. Making the Link from Transportation to Physical Activity and Obesity. Spring 2009. http://activelivingresearch.org/sites/default/files/ALR_Brief_ActiveTransportation_0.pdf. Access Date October 2, 2015.

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Appendix B

ABOUT CHRONIC DISEASES

HEART DISEASE

The term “Heart Disease” encompasses several conditions of the heart. In the United States, coronary artery disease is the most common ailment of the heart, frequently causing heart attack, failure and arrhythmias (Centers for Disease Control and Prevention [CDC], 2009). Coronary artery disease is caused when cholesterol is deposited along the walls of the coronary arteries (the arteries which supply blood to the heart), creating a build up of plaque and narrowing the blood supply available to the heart (Centers for Disease Control and Prevention [CDC], 2013). As the buildup of plaque continues and the heart muscle continues to get insufficient blood supply, the heart will eventually stop pumping, which is commonly called a heart attack (Centers for Disease Control and Prevention [CDC], 2013).

Most heart disease can be prevented by eating a healthy, high fiber diet, consisting of plenty of fruits and vegetables, and foods low in sodium and saturated fat. Another equally important component to the prevention of heart disease is regular physical activity. Those engaging in the recommended 2.5 hours of physical activity per week will have a significantly lower risk of developing heart disease.

Source: Centers for Disease Control and Prevention [CDC], 2013

BMI

A healthy body weight is determined by ratio between height and weight, also called Body Mass Index (BMI). A normal or healthy BMI for adults falls within a range of 18.5 – 24.9%. Adults with a BMI in the range of 25-29.9% are classified as overweight and those with a BMI of greater than 30% are classified as obese. BMI for youth is calculated as Obese individuals have a much higher risk for heart disease, stroke, type 2 diabetes and some types of preventable cancer. The aforementioned chronic health conditions are considered some of the leading causes of preventable death in the United States. Obesity and the resulting health conditions cost \$147 billion annually according to figures amassed in 2008. An individual's likelihood of becoming obese is influenced by three main factors: genetic characteristics, individual behaviors and their living and work environments.

Because weight and height change during growth and development, as does their relation to body fatness, a child's BMI must be interpreted relative to other children of the same sex and age.

Source: (Centers for Disease Control and Prevention [CDC], 2014)

DIABETES

In the United States Diabetes is the seventh leading cause of death and is responsible for a myriad of other health problems. Complications from diabetes include, neuropathy (nerve damage), problems with the eyes/blindness, heart disease, kidney disease, high blood pressure, stroke and lower extremity amputation (Centers for Disease Control and Prevention [CDC], 2015) (American Diabetes Association, N.D).. 9.3% of the population in the United States, or 29.1 million people currently have diabetes, with 8.1 % being undiagnosed and unaware of their condition.

Source: Centers for Disease Control and Prevention [CDC], 2014).

HYPERTENSION

Hypertension is often called the "silent killer" because it has no obvious warning signs or symptoms (Centers for Disease Control and Prevention [CDC], 2015). Gila County residents have more than twice the morbidity rate for Hypertension than any other county in the state. According to 2013 data, Gila County has 610.7 hypertensive residents per 100,000 persons, in comparison with the Arizona state average of 299.5 residents per 100,000

Source: Arizona Department of Health Services [ADHS], Bureau of Public Health Statistics, 2013

Appendix C

STAKEHOLDER ENGAGEMENT PLAN

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GANADO BURNSIDE HEALTH IMPACT ASSESSMENT STAKEHOLDER ENGAGEMENT PLAN

COMMUNITY ENGAGEMENT FOR THE GANADO BURNSIDE ADOT PARA
TRANSPORTATION PLAN HEALTH IMPACT ASSESSMENT

HIA Stage	Stakeholder Engagement Activities	Format/ Methodology	Purpose/ Desired Outcome	Desired Participants	Proposed Date
Process Oversight <i>The oversight process is intended to be used throughout all the stages of the HIA. It helps the project manager and project team manage the HIA schedule and scope.</i>	<ul style="list-style-type: none"> Regular project meetings Monthly project updates 	<ul style="list-style-type: none"> Telephonic every other week Written, provided with invoice 	<ul style="list-style-type: none"> Ongoing project communication 	<ul style="list-style-type: none"> ADHS ADOT PARA Team Consultant 	<ul style="list-style-type: none"> Ongoing
Screening <i>These engagement activities provide an opportunity to work with key community leaders and other potential HIA Stakeholders to determine if conducting an HIA will have a meaningful impact and conduct preliminary outreach to potential HIA participants and beneficiaries.</i>	<ul style="list-style-type: none"> Collaborate with ADHS and ADOT Determine level of interest in HIA within the community Determine if the BIA/Tribe/County has capacity to support/provide data for HIA Examine opportunities for coordination with other, ongoing efforts Explore ways to communicate appropriate to the community 	<ul style="list-style-type: none"> Regular team meetings with ADHS and ADOT PARA Team Contact Chapter Leaders, Elders, and officials within Ganado and Burnside to determine level of interest Contact BIA, Apache County and Sage Memorial Hospital to determine data availability and appropriate outreach tools and methods. 	<ul style="list-style-type: none"> Increase awareness of the benefits of an HIA Expand the number of stakeholders to be more inclusive Assess level of effort based on available data Assess best and most effective outreach methodology Engage potential entities that can assist in implementation (early and later stages) 	<ul style="list-style-type: none"> Ganado District School Administration Students Elders Senior Center Representative Chapter officials Community Health Nurse Other Community Health workers 	<ul style="list-style-type: none"> Before second PARA Technical Advisory Committee Meetings

HIA Stage	Stakeholder Engagement Activities	Format/ Methodology	Purpose/ Desired Outcome	Desired Participants	Proposed Date
Scoping <i>Once a decision has been made to conduct the HIA, these outreach activities will help to deciding which health impacts are important to evaluate, and help determine data sources and an evaluation methodology (for example, from existing studies and data, new research, antidotal information, secondary and related research)</i>	<ul style="list-style-type: none"> • Meet with Community Members and officials to describe HIA and process • Solicit input from the community about important health issues • Coordinate with ADOT PARA Team to identify opportunities for collaboration/interface/ coordination • Research other studies to determine key health issues that might not be apparent to the community • Identify potential improvements related to Community Health • Present the HIA process and scope to tribal elders • Present HIA process at a Chapter meeting • Educate the Community about HIAs and benefits 	<ul style="list-style-type: none"> • Hold three HIA meetings as part of the PARA process • Present information to the PARA Technical Advisory Committee on the relationship between community health and community design • Establish a project website to provide information and solicit ideas via internet-based sources to the community about the relationship between community health and mobility • Interview people walking within the community about how mobility improvements could benefit community health. • Meet with Community Leaders one-on-one • Attend Ganado Health Fair • Meet with/contact Navajo Times and encourage them to write an article in the paper 	<ul style="list-style-type: none"> • Educate the community about the relationship between mobility and health • Develop community interest in the HIA • Develop potential support for conducting the HIA and future mobility improvements • Educate the Community about the benefits of an HIA • Promote civic activity and pride • Promote partnerships for funding and implementation • Engage the Chapter, local health providers and school 	<ul style="list-style-type: none"> • NDOT • ADOT • PARA TAC • School Administration • Elders • Chapter Health Officials and Workers • County Health Officials • Chapter officials • Sage Memorial Hospital 	<ul style="list-style-type: none"> • After 1st TAC meeting

HIA Stage	Stakeholder Engagement Activities	Format/ Methodology	Purpose/ Desired Outcome	Desired Participants	Proposed Date
Assessment <i>This is the point at which the health impacts of the proposed decision are identified. Strategies here discuss opportunities to engage others in the assessment of impacts, provide opportunities to identify new data sources not already identified, and obtain feedback on preliminary findings and recommendations.</i>	<ul style="list-style-type: none"> • Collaborate with other HIAs to identify best practices for analysis • Work with local Chapter, IHS, local hospitals, County Health Departments to analyze data and verify data sources • Reach out to schools, senior centers and clinics to provide data and other resources • Solicit input on Assessment from Technical Advisory Committee and local officials • Conduct field work to review the site and opportunities associated with it 	<ul style="list-style-type: none"> • Email • Outreach through Technical Advisory Committee • Review other HIAs conducted in the region and state. • Research websites provided by State, Pew Trust, Collaborate with Alliance for Livable Communities (ALC) • Conduct SRTS Assessment • Walk Score • Provide Assessment information via digital outreach and School District and Clinic website • Participate in PARA public meeting and Radio Show to talk about the connection between mobility with regards to health 	<ul style="list-style-type: none"> • Document intuitive expectations with fact • Provide documentation for use with PARA recommendations • Build fact based support for the connection between physical activity and health that is directly related to the community 	<ul style="list-style-type: none"> • Consultant • BIA • Apache County Health Department • ADHS • Sage Memorial Hospital • School District • Chapter Administration 	<ul style="list-style-type: none"> • Develop data resources and assessment prior to 2nd Steering Committee Meeting; Present Assessment at 2nd Steering Committee Meeting

HIA Stage	Stakeholder Engagement Activities	Format/ Methodology	Purpose/ Desired Outcome	Desired Participants	Proposed Date
Recommendations <i>These outreach activities solicit feedback on the preliminary recommendations; are the practical and feasible, do they require additional funding, are they culturally and environmentally appropriate?</i>	<ul style="list-style-type: none"> • Provide short, mid and long term recommendations to PARA with regards to community health • Integrate ideas provided by Community through outreach • Test ideas with PARA TAC and through outreach 	<ul style="list-style-type: none"> • Presentation at TAC Meeting and Public Meeting associated with PARA • Direct residents to website where they can provide comment via flyers sent home with school children or made available through other community venues 	<ul style="list-style-type: none"> • Solicit feedback on recommendations and refine them for implementation • Develop support for recommendations and potentially identify options for implementation 	<ul style="list-style-type: none"> • NDOT • ADOT • TAC • Community • Chapter officials • Elders • School District • Sage Memorial Hospital • School District 	<ul style="list-style-type: none"> • Solicit recommendations at 2nd TAC meeting • Present recommendations for comment at 3rd TAC meeting
Reporting and Communication <i>During this phase of outreach the HIA results and recommendations are shared with the community. Some final refinements to the recommendations may be made at this stage.</i>	<ul style="list-style-type: none"> • Post recommendations and report on Sage Hospital Website • Present report at a Chapter Meeting • Provide a copy of the report to ADCS, County Health Department 	<ul style="list-style-type: none"> • In person presentation at Chapter Meeting • Digital Transmittal to County and State Health Departments 	<ul style="list-style-type: none"> • Identify potential support for short, medium, and long term recommendations • Increase awareness if the connection between physical activity and community design 	<ul style="list-style-type: none"> • NDOT • ADOT • School District • TAC • Community • Chapter officials • School District • Sage Memorial Hospital 	<ul style="list-style-type: none"> • Upon delivery of final product
Monitoring <i>These outreach activities are designed to determine how future HIAs can be improved and keep HIA participants updated on the impacts of the HIA and its implementation.</i>	<ul style="list-style-type: none"> • Present regular updates on progress of HIA Implementation at Chapter Meetings • Keep Chapter informed of implementation progress • Provide to elders • Engage the school district in implementation 	<ul style="list-style-type: none"> • In person presentation at Chapter Meetings • In person presentation at School District Board Meetings • Partner with Sage Memorial Hospital 	<ul style="list-style-type: none"> • Enhanced Safety and ongoing pursuit of recommendations in HIA and PARA 	<ul style="list-style-type: none"> • NDOT • ADOT • Chapter officials • School District 	<ul style="list-style-type: none"> • Ongoing

Appendix D

OUTREACH MATERIALS

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GANADO



BURNSIDE

HEALTH IMPACT ASSESSMENT



Presentation Outline

1. Purpose of a Health Impact Assessment (HIA)
2. HIA Benefits
3. Health Impact Assessment Process
4. Coordination with PARA
5. Data collection
6. Your ideas and questions

HIA Purpose

WHAT: To inform deliberations regarding from a public health perspective on a specific proposed activity or policy.

WHY: Broaden the community health discussion beyond the individual behaviors and factor to leverage a broad range of opportunities to enhance community well-being

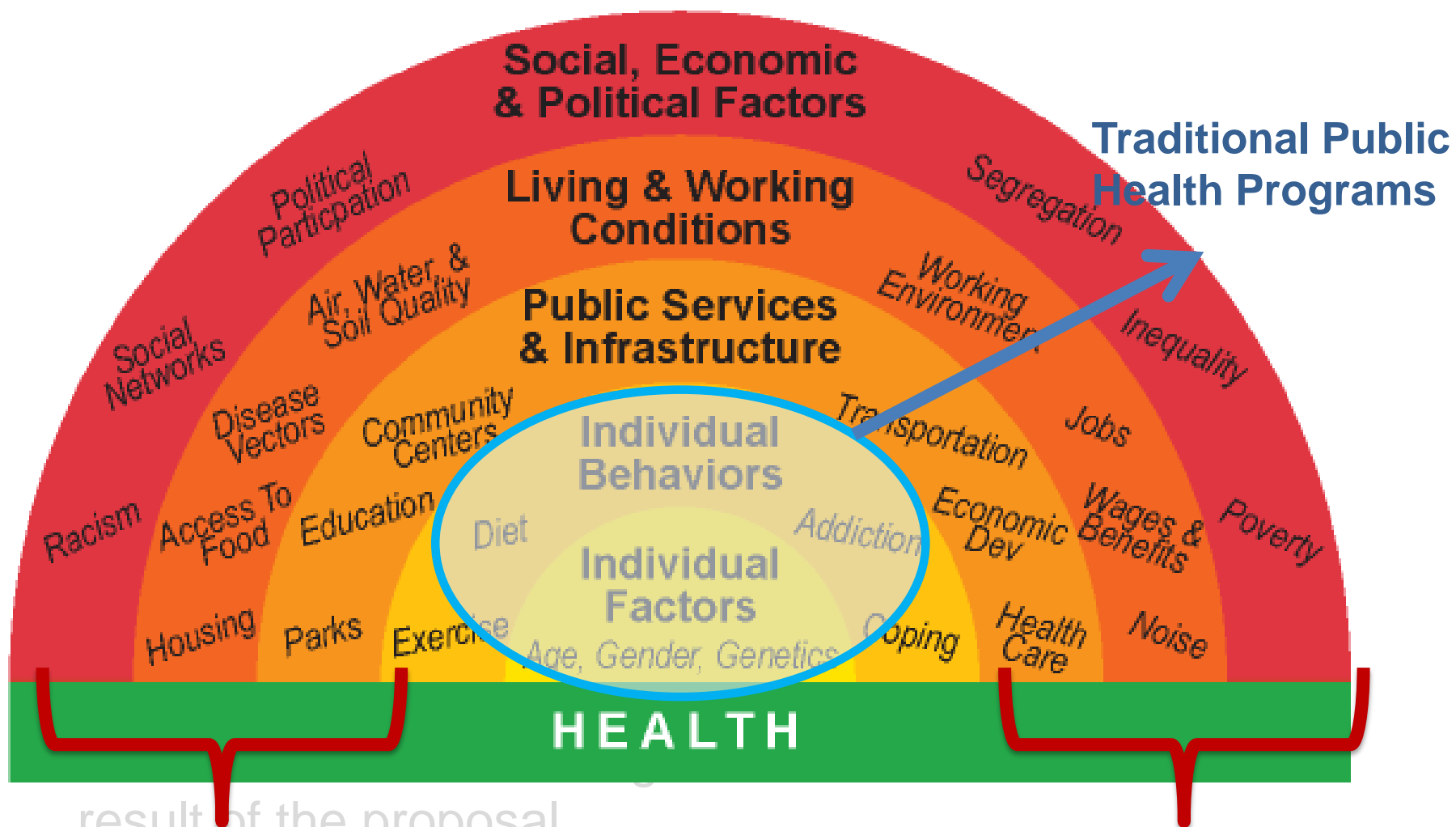
HOW: Assess the multiple influences on community health that can occur as a result of social, economic, and environmental changes that could occur as a result of the proposal.

An HIA is.....

A structured, but flexible, process that:

- Identifies **UN**anticipated future health outcomes of a decision/project
 - Translates that information into balanced, well-informed recommendations for future decisions/policies/actions
 - Helps to evaluate direct and indirect future health impacts of a decision/project
- **Is NOT** used to make the case for why a policy, plan, program or project **SHOULD** be proposed
 - **Is NOT** used to **STOP** a policy, plan, program or project
 - **Is NOT** used to assess impacts **AFTER** implementation
 - **Is NOT** a community assessment tool

HIA Purpose



HIA Purpose

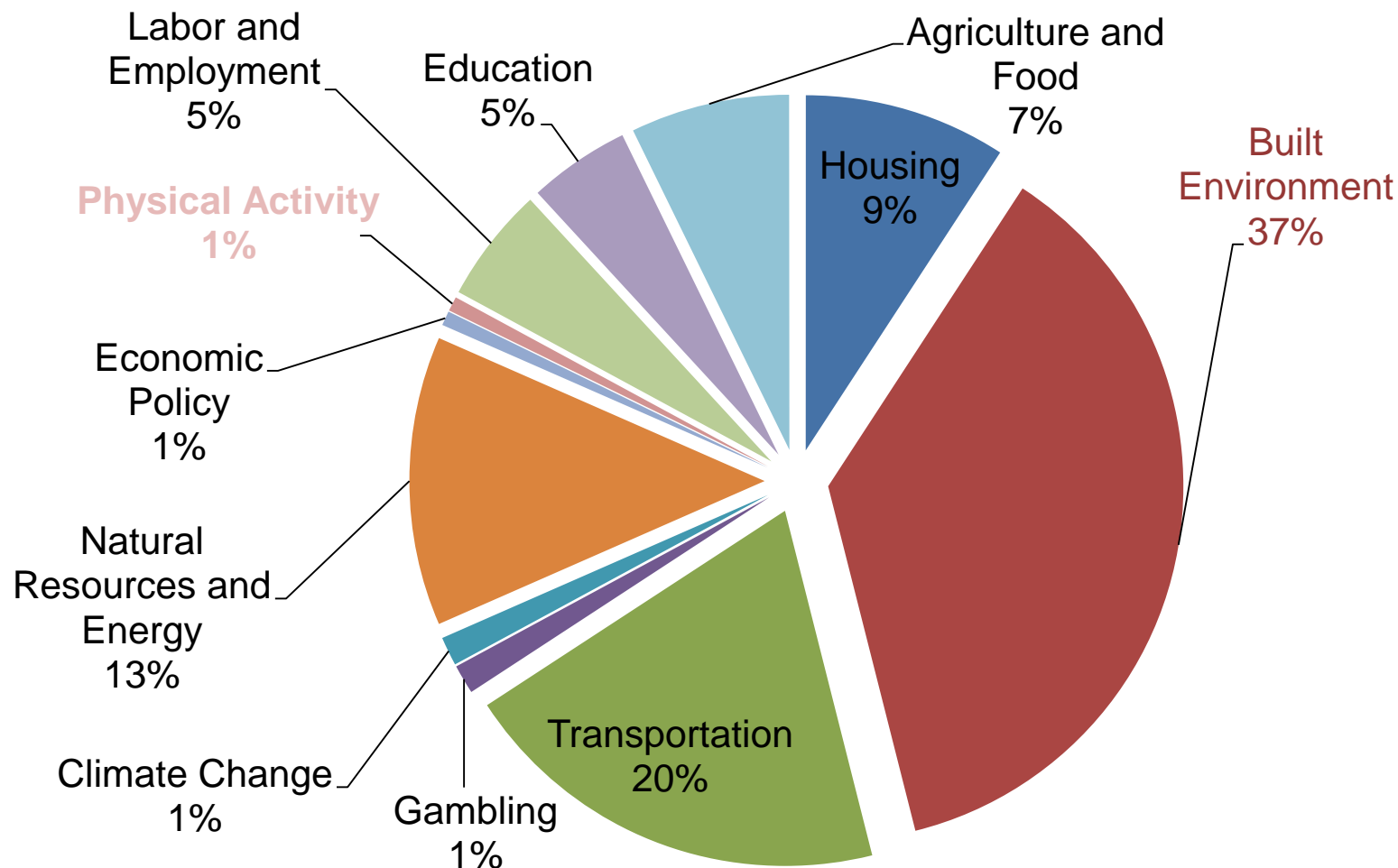
WHAT: To inform deliberations regarding from a public health perspective on a specific proposed activity or policy.

WHY: Broaden the community health discussion beyond the individual behaviors and factor to leverage a broad range of opportunities to enhance community well-being

HOW: Assess the multiple influences on community health that can occur as a result of social, economic, and environmental changes that could occur as a result of the proposal.

HIA Purpose

TOPICS ADDRESSED BY HIAS (NATION WIDE)



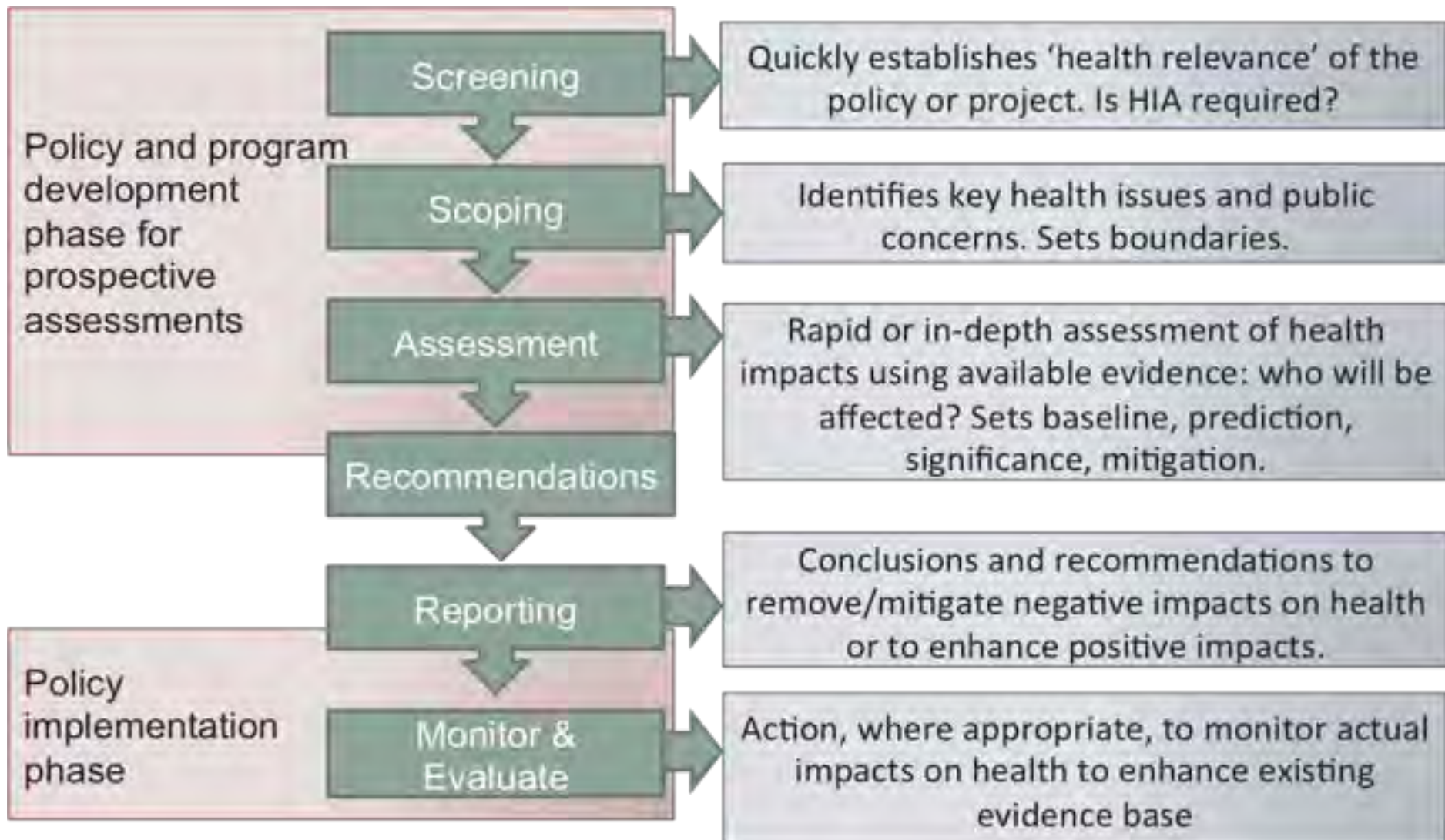
HIA Benefits

Conditions in the places where we live, work and play have a tremendous impact on Americans' health.

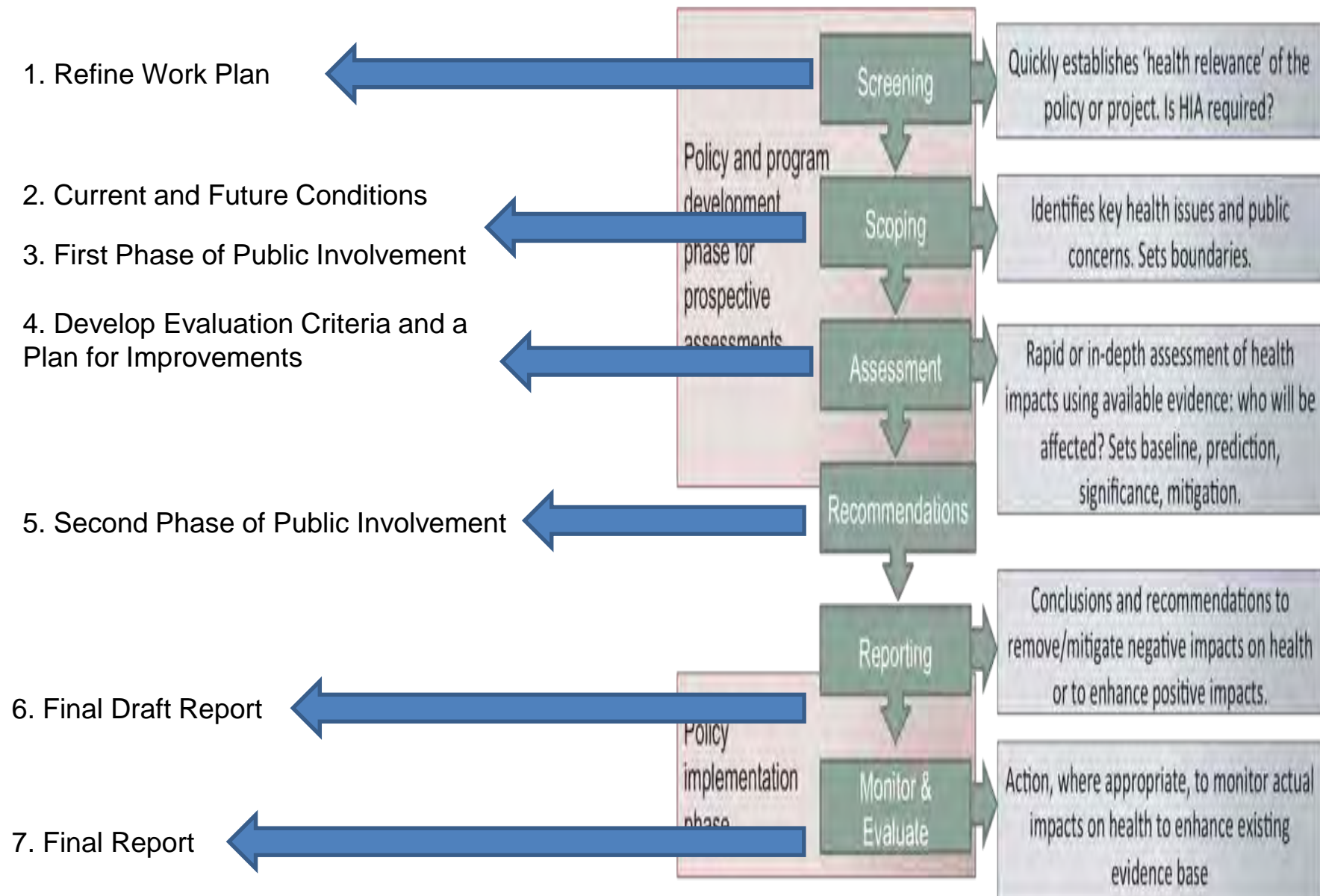
The benefits of this HIA will be to:

- Leverage transportation to contribute to community health
- Inform the PARA process so that the plan recommendations will include facilities for mobility that benefit community health
- Help to identify barriers to access that could be address through the PARA
- Identify opportunities for facility design that could contribute to enhancing community health

HIA Process



PARA Coordination



HIA Data Sources

- Community Engagement
- Stakeholder meetings
- Community Health surveys
- Accident reports
- Pedestrian/bicycle counts
- Census
- Other?

Your Ideas and Questions

- Are there other studies/projects that could inform this HIA?
- What mobility-related community health concerns do you have?
- How do you think this project could impact community health?
- What would you like to see this HIA accomplish?
 - Improve community awareness of relationship between mobility and health
 - Provide enhancements to transportation facilities that could improve health
 - Improve health through safety enhancement
 - Improve health through improved connectivity for pedestrians and cyclists
 - Provide options for recreation and mobility



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Presentation Outline

What is Healthy Transportation?

Why is it important?

How can we provide healthy transportation in Ganado and Burnside?



Why Healthy Transportation Matters

Healthy Transportation means using human energy to travel from place to place. Healthy transportation includes bicycling, walking, and other forms of non-motorized travel. Healthy transportation emphasizes the connection between healthy, active living and our transportation choices.

When neighborhoods have sidewalks, streets are well lit, and people who walk are shielded from traffic, residents are often found to walk more and have higher physical activity ⁽¹⁾

Sources

Role of Built Environments in Physical Activity, Obesity, and Cardiovascular Disease. [James F. Sallis](#), PhD; [Myron F. Floyd](#), PhD; [Daniel A. Rodríguez](#), PhD; [Brian E. Saelens](#), PhD

Why Healthy Transportation Matters

When you are active, your cells become more sensitive to insulin so it can work more efficiently. During exercise, your cells also remove glucose from the blood using a mechanism totally separate from insulin.

So, exercising consistently can lower blood glucose and improve your A1C. When you lower your A1C, you may be able to take fewer diabetes pills or less insulin.

- **25,000 with diabetes and another 75,000 are pre-diabetic**
- **31% of Navajo pregnancies were complicated by Diabetes**



Sources:

Resolution of the Navajo Nation 22nd Navajo Nation Council – Fourth Year 2014. Act Amending 24 NNC ¶¶605 ET SEQ.

American Diabetes Association

2014 Older Americans Month celebration on May 2 in Page, Ariz.

Why Healthy Transportation Matters

- In 2009 the obesity rate within the eight services units of the Navajo Area HIS ranged from 23% to 60% for all age groups
- Obesity and diabetes have become major health threats to the Navajo people in a brief period of time
- heart disease is the second leading cause of death for Navajo
- The suicide rate among American Indians across the nation ages 15 to 34 is twice as high as the national average



Sources:

Resolution of the Navajo Nation 22nd Navajo Nation Council – Fourth Year 2014. Act Amending 24 NNC ¶¶605 ET SEQ.

The Navajo Nation Initial Response To The National Health Care Reform Initiative

NPR: August 31, 2012 . Laurel Morales. Fronteras Desk

Why Healthy Transportation Matters

Regular physical activity

- Lowers blood pressure and cholesterol
- Lowers your risk for heart disease and stroke
- Burns calories to help you lose or maintain weight
- Increases your energy for daily activities
- Helps you sleep better
- Relieves stress
- Strengthens your heart and improves your blood circulation
- Keeps your joints flexible
- Strengthens your muscles and bones
- Improves your balance to prevent falls
- Reduces symptoms of depression and improves quality of life



How Can We Plan for Healthy Transportation?

- Understand how transportation facilities impact community health and physical activity.
- Help to identify barriers to mobility and physical activity that could be addressed through the underway transportation plan.
- Inform the underway Transportation Plan so it includes projects that benefit community health.
- Identify opportunities to create community transportation facilities that encourage physical activity and are safe, convenient, and comfortable.



What Are Your Ideas?





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Presentation Outline

What is Healthy Transportation?

Why is it important?

How can we provide healthy transportation in Ganado and Burnside?



Why Healthy Transportation Matters

Healthy Transportation means using human energy to travel from place to place. Healthy transportation includes bicycling, walking, and other forms of non-motorized travel. Healthy transportation emphasizes the connection between healthy, active living and our transportation choices.

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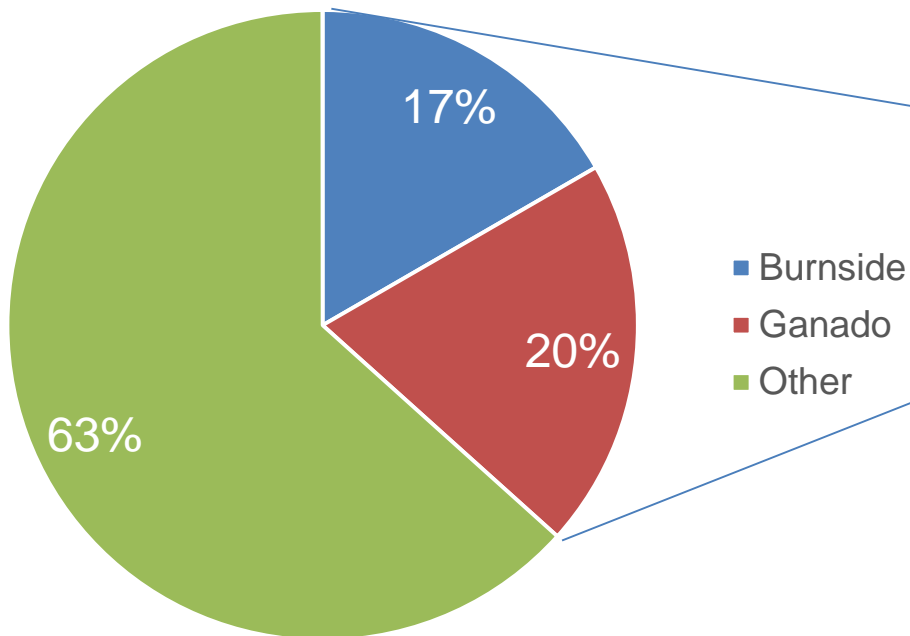
How Can We Plan for Healthy Transportation?

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- Inform the underway Transportation Plan so it includes projects that benefit community health.
- Identify opportunities to create community transportation facilities that encourage physical activity and are safe, convenient, and comfortable.



What Have We Learned?

People From Ganado and Burnside Walk



37% of all the people we spoke to at the Burnside traffic circle were from Ganado and Burnside

What Have We Learned?

People In Ganado and Burnside Walk for their Health

Why Are You Walking Here?

Health

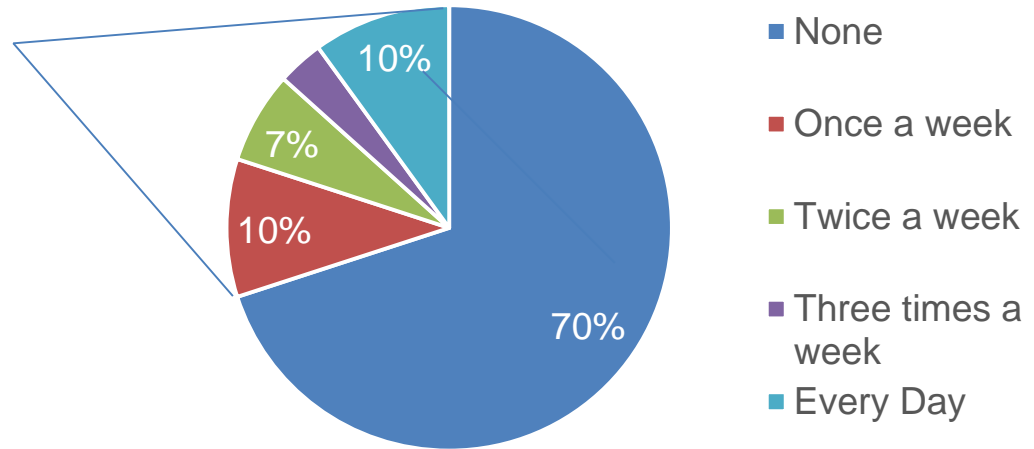
To Save Gas

Walking to Various Services in
Commercial Area

What Have We Learned?

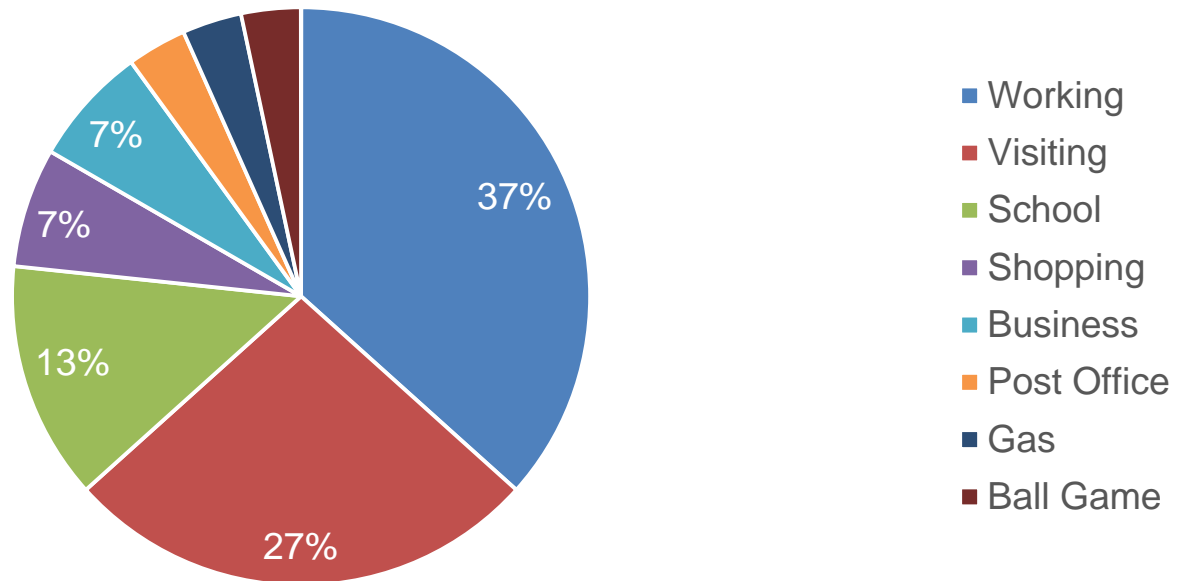
People In Ganado and Burnside Walk Regularly

30% of those people surveyed walk regularly, and 30% of those who walk regularly walk every day.



What Have We Learned?

People In Ganado and Burnside Walk For A Variety of Reasons



What Have We Learned?

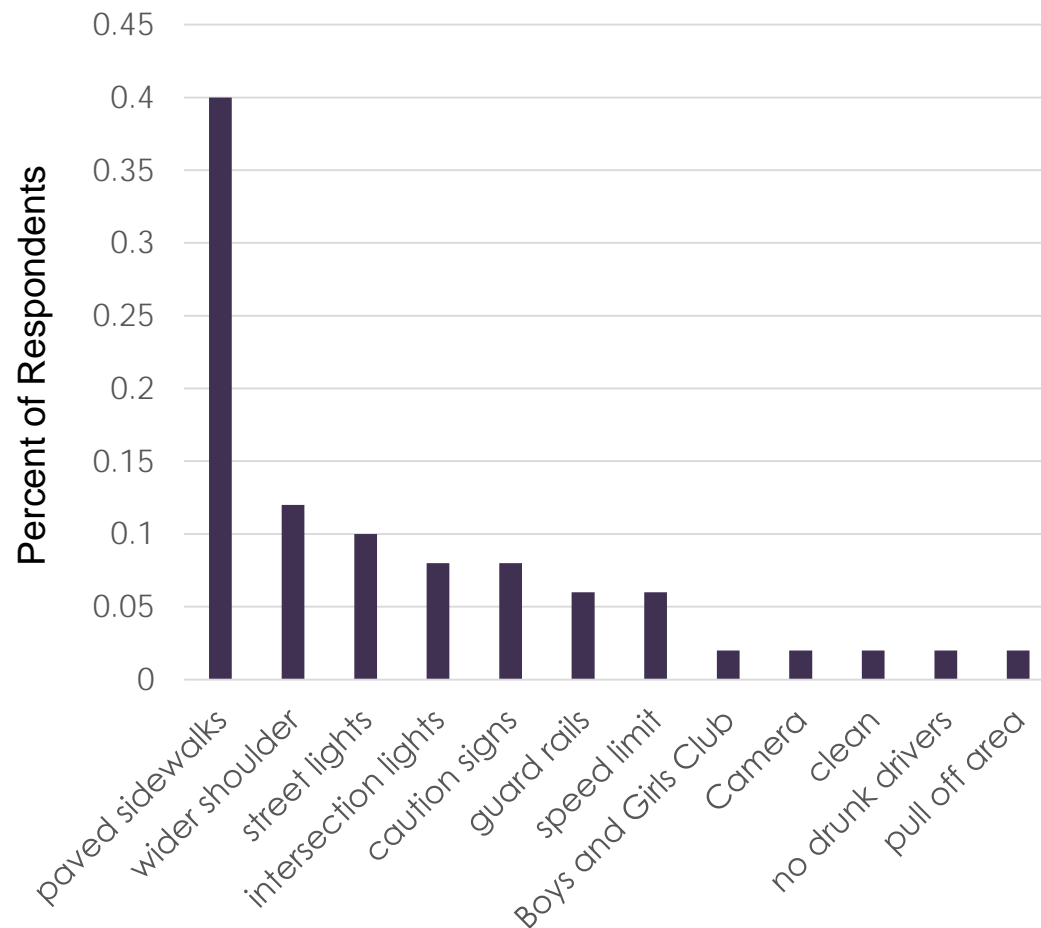
Where People Are Walking To and From

- Ganado Post Office
- Cornfield
- After the Sheep
- Ganado Stores
- Sage Hospital



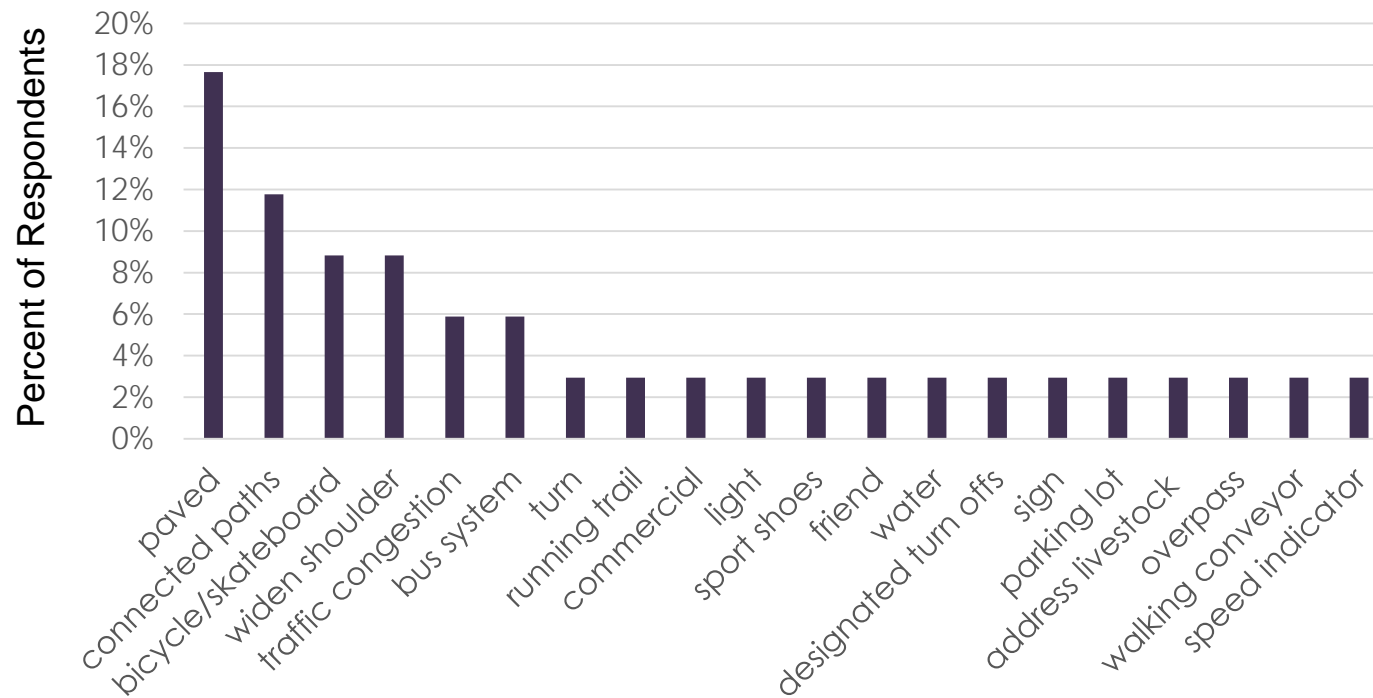
What Have We Learned?

What People Say Would Make Their Walk Safer



What Have We Learned?

What People Say Would Make Their Walk Better



What Have We Learned?

What Stakeholders Say:

Elders

- Need places to walk around the Senior Center
- Need Lights at the Ganado and Burnside intersections
- Lights on the Overpass
- Need walking trails throughout the community
- Need bus pull outs along the road
- Need benches and shelter at the bus stop
- Need level surfaces to walk
- Need accommodations at intersections and bus stops for blind and disabled
- Need better roads from remote areas to paved roads

School District

- Need bus pull outs along the road
- Need parking areas at school bus stops
- Need shelter and lights at school bus stops
- Need better roads from remote areas to paved roads
- At grade crossings at elementary, middle, and high schools for pedestrians
- Need sidewalks along SR264 and SR191
- Lots of students run for exercise – running paths

Chapter/Trading Post

- Need Places for Physical Activity
- People living at trading post and visitors would use trails to market and store
- Need more pedestrian crossings (at grade)
- Need parks
- Need to provide places for people to walk along the road





- Long term plan for hospital is to change access to connect majority of people to hospital...new development planned for west area of the hospital. Just has a chain across it now...
- Street lighting....need it from Ganado school all the way to the hospital to the turn off...the entire area in Ganado to the bridge.
- Hubbell access...people were afraid to turn in because it looks like the church entry.
- Signing? Is that an issue? People don't realize how close the turnoff is to Ganado...There needs to be a sign that tells you several blocks ahead of time?
- People still use the trading post to get groceries and to go there. There are people that work there...there are 40-50 staff there...lots of people that work there especially in the summer. Lots of tourism there. There is a trail to there...tourists walk it in the summer...residents around there still walk there because not everyone has vehicles.
- Taking pedestrian development into consideration...with future development...pedestrian trail is still a long term...it's been there for decades. People will still use it ...plan for pedestrian trail is important for walking for health. There are plans for hotels, motels but not at Hubbell...the plan now is housing because the housing authority is looking for opportunities.
- Majority of community within a 2 mile radius walks into Ganado. Walking trails are important (MGD trail). When it's nice, people use trails, when it's muddy etc., people walk on the pavement.

TOPIC: CONNECTIVITY BETWEEN BURNSIDE AND GANADO

- Need a multi-modal trail within the right of way...10-12' wide. People walk all the way from Burnside to Ganado.
- Highest need is local in Burnside and Ganado, long term, between Burnside and Ganado.
- Majority use the south side.
- Need to slow traffic between Burnside and Ganado. Maybe ¼ mile from...there is a dip. Doesn't know why it is there...but it is a bad spot for accidents.
- Speed supposed to be 55 mph but actual is 70 mph.

BURNSIDE IMPROVEMENTS

- Next to restaurant there will be a subdivision 20-30 houses in next decade...Development planned by the school and housing in that area too. There are a lot of vacant buildings there. They may tear some down and put housing there....
- People come to Ganado for services from Burnside...more housing going into Burnside. Burnside is more shopping and vendors...Ganado is more services for community.
- Transit by gas station in Ganado by service station in Burnside.
- Will the new transit be like a park and ride? By post office...what are they planning? Check with NDOT for transit.
- Ganado has all infrastructure now...water sewer natural gas (no gas in Burnside) to attract infrastructure. That is in the development plan.
- Transit is well used. Is it regional or just between Burnside and Ganado. Lot of people use it from housing at Burnside to hospital. Also used regionally from Burnside. N transit has percentages of use.
- Intersection at 27 and BIA road 9034 going west on 264 needs a roundabout...to slow down traffic. Once you pass that intersection in 200 yards you go down the hill and hit a school zone.



- Same thing on 191 going north. Same thing, there is a hill there. Soon as you top the hill Ganado is there and you don't realize there is an intersection and how much traffic is there and that there is a 55 mile zone...maybe a stoplight and not a roundabout. Lot of Truckers use 191 to avoid inspection station on I-40. That road leads to airport...and there is a plan to improve the airport. The airport is used for air evac...so that is a consideration.
- Air evac for health? Looking at Ganado for 2015-2016. No aviation planning for the study..but looking at access to airport.



GANADO STAKEHOLDER MEETING III NOTES

Attendees (requested list from Jacobs)

About 2 people

UTILITIES

- Have heard of hotel and shopping center. New natural gas line ROW exists to supply Burnside junction. Want to make sure that any roadway development respects this planned gasline. Applicable to gas, water, wastewater. Want to make sure alignments coincide with roadway and future developments. Alignment on north or south side?
- Can alignment be used for pedestrian amenities? If they need to dig up pedestrian path, there is no money to repair it...so rates don't allow for restoration of pedestrian amenities.
- For construction...they are constantly seeking sources of funding for gas line construction....don't know if dollars are adequate to cover costs of construction.

NAVAJO HOUSING

- Navajo Housing plans follow arteries and where traffic is. Have some residential areas within project area.
- There are some higher development areas...try to locate housing there. Also looking at housing near shopping center...which is planned on same side as burger king...and also south of school. Also worried about bridge crossings, and where people cross. There is a lot of traffic on both sides of the street. Until they see some hard maps they can start planning.
- All housing is designed for walking...main concern is utilities. Look to see if its rental or ownership....depends on the planning down the road. As of yet the whole reservation doesn't have any hard plan for development...would rather follow path of growth of highways...prefer building subdivisions...like neighborhoods...
- Swaback did a design for housing and they will share with us. Housing is focusing on homes for people that need them.
- Want to use infill lots, however its hard to do access roads...able to put streets in residential areas with utilities...but if development is 2-3 miles from the highway the owners have to make the roads.
- Majority of new housing near Burnside. Not much near Ganado...A developer can come in and develop an area...looking at that down the road. Main issue is the ROW....
- N27 upgrade
- Emergency...Navajo have their own 411 system. Trying to get all housing identified for the system. Right now it's not finished.
- Lighting within a different budget...as is housing...and speed bumps....



FOLLOW UP:

- Need Ganado plan and Burnside plan
- Will Jacobs do a planned development and existing land use map? Will they share?
- Will they share Burnside Plan?
- Utilities Map
- What is this shoulder widening project? When is it happening? Where is it exactly?
- N27 upgrade from Chinle? Paving this?
- Get prepared notes from Navajo Housing (Victor ?) Also get copy of Swaback plan.
- Burnside: Need to find out more about housing, shopping centers in 10-20 years with vendors.... Development from the school?



GANADO STAKEHOLDER MEETING II NOTES

Attendees (requested list from Jacobs)

About 5 people

Ganado

TOPIC: Safety and Infrastructure/Congestion and Mobility

- The bridge (Hubbell) and the speeds people use it goes all the way up to the school...From the bridge to Burnside there is a hazard because people drive 70 mph. People use the road to bypass the freeway and everyone is maintaining their freeway speeds. Somehow, people that are travelling through need to slow down through the community.
- There is livestock on the road and it's unsafe.
- The bridge is unsafe for pedestrians too because you can't cross the wash
- They are going to replace the bridge...with that in mind, the engineers need to address pedestrian issues that are associated with the bridge.
- There are community members that walk to the chapter house or clinic and they use the bridge so it's difficult to go down into the wash.
- Roundabout has reduced the accidents...where are they now? Only one officer assigned to Ganado area. Most of their time is taken up with domestic issues...so they don't have the time to check speeds. Changing speeds through design could help to slow down traffic...like with a roundabout. At 127 and 264...by flea market and hospital there could be a roundabout.
- The post office turn off and the 191 turn off is hard to turn left because of traffic.
- Talking about closing a turnoff...or creating a frontage road. That would be a good solution.
- There is a road to the HS that is only used during a parade. There is a gate. HS should use it. There is one just south of Fansil (?) Hall...
- There is one by the post office too that loops around.
- The problem is the bridge...trucks cause northbound traffic to wait, and you've got the double roads, one from hospital and one from post office and other entries.
- In Burnside people are using crosswalks at roundabout.
- Maybe look at short term, mid, and long term improvements....roundabout is short term.

TOPIC: PEDESTRIAN, BICYCLE, TRANSIT/FUTURE CONDITIONS

- Need to find out what is included in improvements from Burnside to Fish wash...are these going to be addressed through that project? Not a lot for pedestrians....
- Crossings need to be signed and potentially signalized. Lots of these options would be useful...
- There is an overhead crosswalk but they don't use it because it's too far off the road. Students still run across the road and in Ganado they cross anywhere they want to.
- Most people are crossing at the intersection....but people cut across at business section....
- In the next five years, there is a big increase in services at Sage and that's only going to add to traffic. Maybe 20 more homes and a medical office or two.
- People from the north cross from fire station and apache county office....lots of people go through west gate to hospital...
- Why they don't use overpass is it's not the shortest way....



GANADO BURNSIDE HEALTH IMPACT ASSESSMENT WHAT IS A HEALTH IMPACT ASSESSMENT?

BACKGROUND AND INFORMATION ON THE HEALTH IMPACT ASSESSMENT
PURPOSE AND PROCESS

List of Topics

1. What is an HIA
2. HIA Benefits
3. Purpose of a Health Impact Assessment (HIA)
4. Health Impact Assessment Process
5. Coordination with PARA
6. HIA Data sources



1. What is An HIA?

An HIA informs policy and project decisions from the perspective of community health.

Conditions in the places where we live, work and play have a tremendous impact on Americans' health.

- 25,000 with diabetes and another 75,000 are pre-diabetic 31% of Navajo pregnancies were complicated by Diabetes
- In 2009 the obesity rate within the eight services units of the Navajo Area HIS ranged from 23% to 60% for all age groups (1)
- When neighborhoods have sidewalks, streets are well lit, and pedestrians are shielded from traffic, residents are often found to walk more and have higher physical activity (2), and
- Regular physical activity is one of the most important things you can do for your health. (3)

1. Resolution of the Navajo Nation 22nd Navajo Nation Council – Fourth Year 2014. Act Amending 24 NNC ¶¶605 ET SEQ.

2. Role of Built Environments in Physical Activity, Obesity, and Cardiovascular Disease. [James F. Sallis](#), PhD; [Myron F. Floyd](#), PhD; [Daniel A. Rodríguez](#), PhD; [Brian E. Saelens](#), PhD

3. Centers for Disease Control. <http://www.cdc.gov/healthyplaces/healthtopics/physactivity.htm>. Access date 4-14-2015

2. HIA Benefits

Conditions in the places where we live, work and play have a tremendous impact on Americans' health.

The benefits of the Ganado Burnside HIA will be to:

- Understand how transportation facilities impact community health and physical activity.
- Leverage proposed transportation projects to contribute to community health.
- Inform the PARA Transportation Planning process so that plan recommendations include transportation facilities that allow for physical activity and benefit community health
- Help to identify barriers to mobility and physical activity that could be addressed through the PARA.
- Identify opportunities to create community transportation facilities that encourage physical activity and are safe, convenient, and comfortable.

3. HIA Purpose

WHAT: To inform, from a public health perspective, recommendations and/or decisions resulting from a specific policy, plan, or project.

WHY: Broaden the community health discussion beyond the individual behaviors and factor to leverage a broad range of opportunities to enhance community well-being

HOW: Assess the multiple influences on community health that can occur as a result of social, economic, and environmental changes that could occur as a result of the proposal.

3. HIA Purpose

An HIA is a structured, but flexible, process that:

- Identifies **UN**anticipated future health outcomes of a decision/project
 - Translates that information into balanced, well-informed recommendations for future decisions/policies/actions
 - Helps to evaluate direct and indirect future health impacts of a decision/project
- **Is NOT** used to make the case for why a policy, plan, program or project **SHOULD** be proposed
 - **Is NOT** used to **STOP** a policy, plan, program or project
 - **Is NOT** used to assess impacts **AFTER** implementation
 - **Is NOT** a community assessment tool

3. HIA Purpose

WHAT: To inform deliberations regarding from a public health perspective on a specific proposed activity or policy.

WHY: Broaden the discussion of improving health beyond individual health and behaviors by considering social, economic, and environmental factors that impact enhance community health and well-being

HOW: Assess the multiple influences on community health that can occur as a result of social, economic, and environmental changes that could occur as a result of the proposal.

WHY an HIA is beneficial



3. HIA Purpose

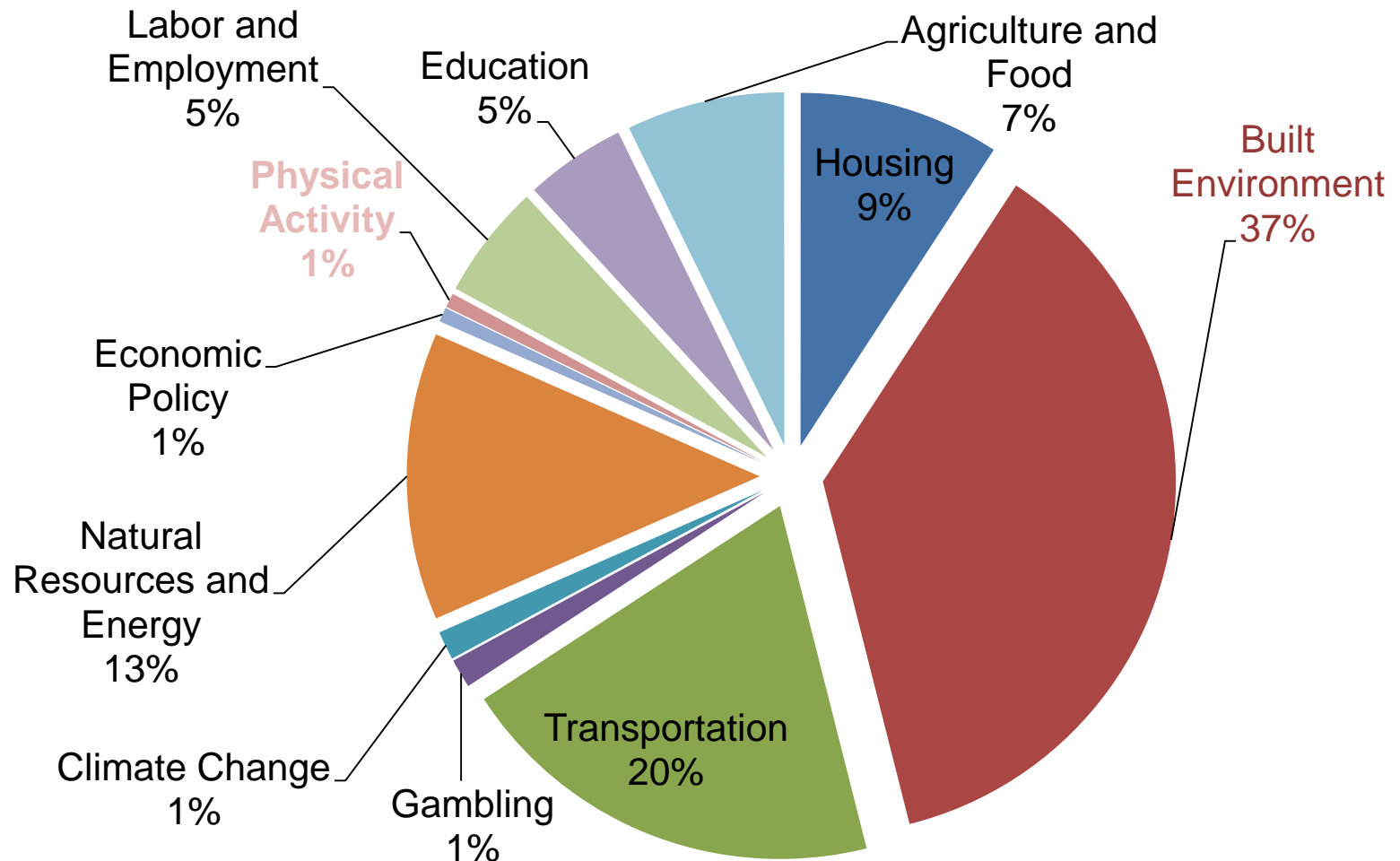
WHAT: To inform deliberations regarding from a public health perspective on a specific proposed activity or policy.

WHY: Broaden the community health discussion beyond the individual behaviors and factor to leverage a broad range of opportunities to enhance community well-being

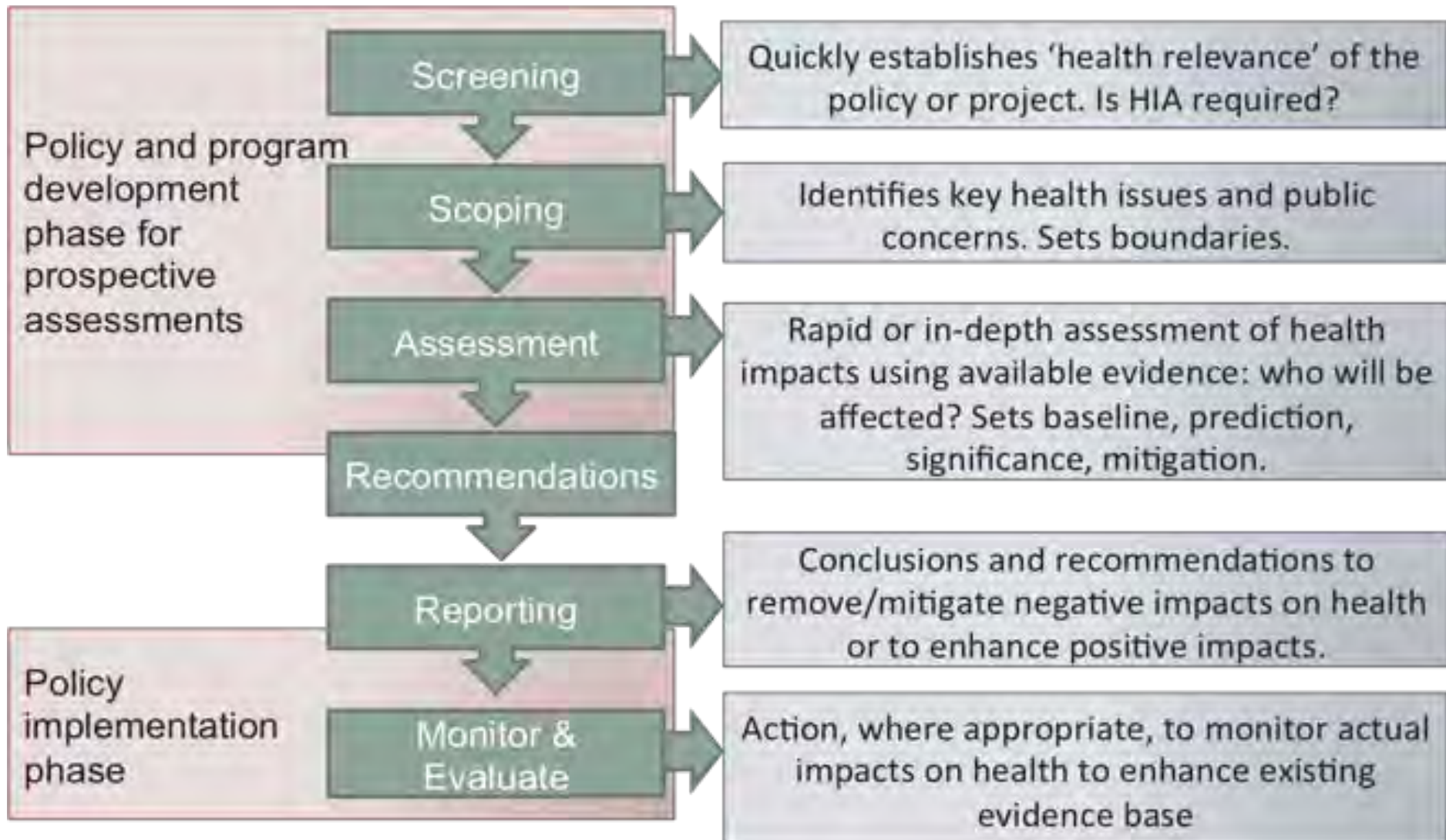
HOW: Assess the multiple influences on community health that can occur as a result of social, economic, and environmental changes that could occur as a result of the proposal.

3. HIA Purpose

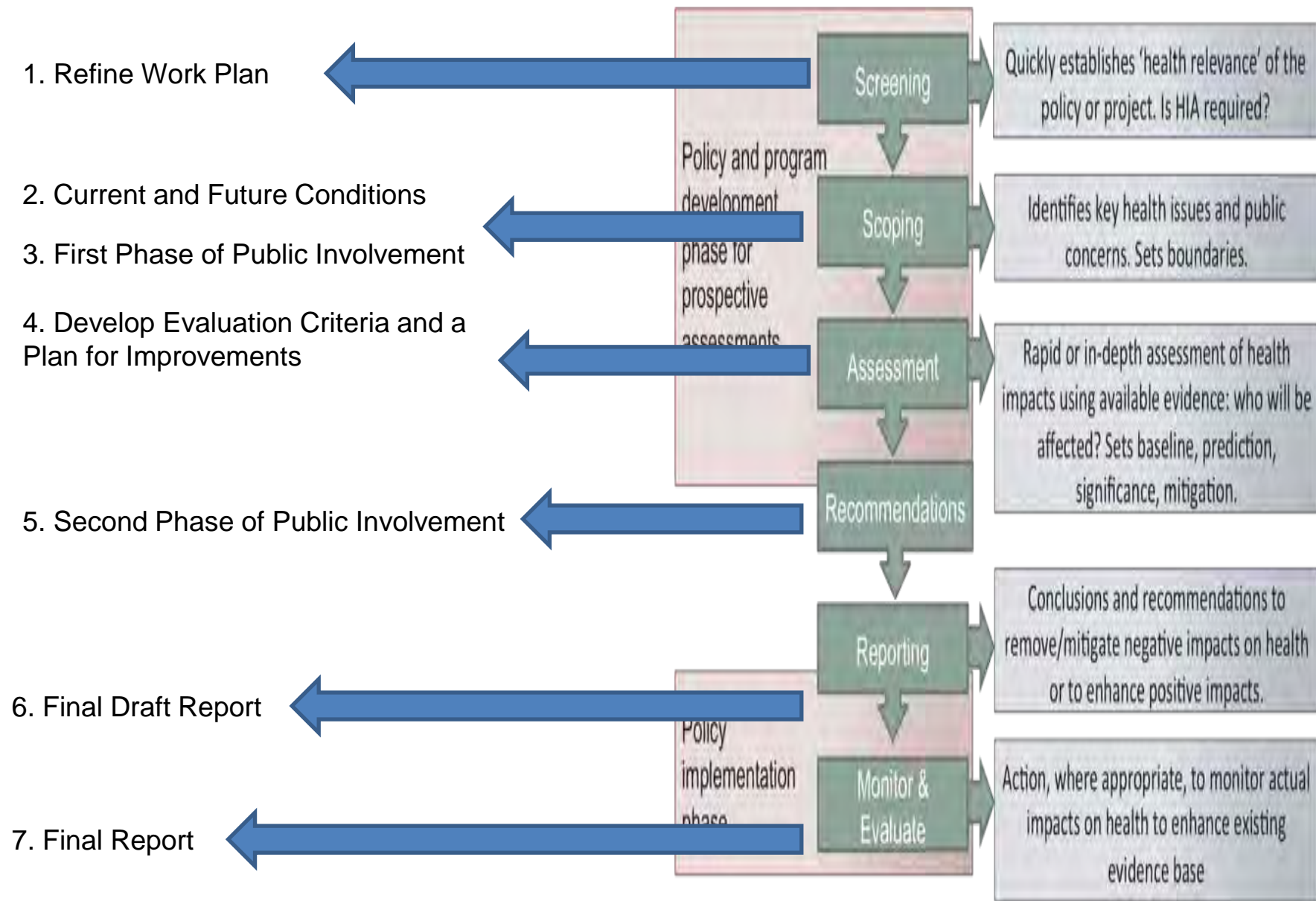
TYPES OF POLICIES AND PROJECTS INFORMED BY HIAs (NATION WIDE)



4. HIA Process



5. PARA Coordination





7. HIA Data Sources

- Community Engagement
- Stakeholder meetings
- Navajo Nation Health surveys
- Apache County Health Surveys
- IHS Health Surveys
- Accident reports
- Pedestrian/bicycle counts
- Census
- Other?

Appendix E

SURVEY

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Hello, my name is _____. I am working with the Arizona Department of Health to learn how we can better design transportation and roads in Ganado and Burnside to make them healthier places to live. We are doing this because physical activity is closely related to health, and people need to be able to have choices that enable them to safely and comfortably travel through their community. We are conducting this survey so that the types of recommendations that are made in this study reflect what the community wants. Would you be willing to help by answering a few questions about how you travel to different places in the community?

Purpose of this Trip?

Do you take the bus?

Where to you take it from?

What would make your bus stop more pleasant?

How many trips a week do you take walking on this road?

Other destinations you walk to?

What would make your walk safer?

What would make your walk easier?

Do you own a car?

If yes, why do you choose to walk?

Do you use a bicycle to go places?

If yes, Where do you use your bicycle?

**Would you share how old you are?
(circle one)**

Under 16 years old?

16-18 years old?

18-21 years old?

21-65 years old?

65 – 75 years old?

Older than 75 years old?

SURVEY TIME (circle one) AM Midday PM

SURVEY LOCATION _____

SURVEY DATE 4/23/15 4/24/15