Chapter Six

Transportation

1. INTRODUCTION

Transportation planning has emerged as a key issue in Brown Deer, and the provision and maintenance of transportation facilities – streets and roads, sidewalks, bicycle lanes and multi-use trails, crosswalks, mass transit and access to the regional transportation system is a key function of local, county and state governments. The Transportation chapter analyzes:

- Results from the public involvement process,
- Existing transportation conditions in the Village, and
- Transportation plans from other jurisdictions that affect mobility and access in the Village, such as Milwaukee County and the Wisconsin Department of Transportation

The chapter includes goals and objectives to meet the future transportation needs of the community, and policy recommendations for the Village to proactively ensure that priorities of stakeholders are addressed.

2. VISION STATEMENT

The Village of Brown Deer Vision Statement articulates an understanding of the role the transportation system plays in the Village's identity and quality of life. The statement claims that Brown Deer's "location will provide easy access to regional employment opportunities and a variety of urban amenities."

It further states that Village residents are bound together by their shared belief in "safe streets and neighborhoods, and pleasant surroundings." They also envision a future Brown Deer in which "the Village will be scenic, well-tended and green…and public property will be well-maintained."

3. STAKEHOLDER INVOLVEMENT RESULTS

Stakeholders consider Brown Deer's well-maintained road network an asset to the Village; mobility is well accommodated for residents, employees, shoppers and visitors with access to an automobile. For those without access to a private vehicle, mobility and access in the Village can be considered somewhat limited. The elderly in particular report difficulty in accessing needed services, and many noted that transit service is inadequate and pedestrian facilities are not uniformly provided, even along principal thoroughfares. Senior citizens who are unable to drive must ask peers, neighbors or family members for assistance in traveling in Brown Deer. The same is reported to be true for the Village's younger residents. Street grid connectivity in the northeastern corner of the Village is considered inadequate by some stakeholders.

Vehicular traffic speeds and volumes on Brown Deer Road, Green Bay Road, and several other arterials and collectors are considered by many participants to be both dangerous to users and detrimental to the Village's quality of life. Many identified the intersections of Green Bay Road/Teutonia Avenue, Green Bay Road/Brown Deer Road, and Teutonia Avenue/Sherman Boulevard/Bradley Road as having design problems leading to difficulties for motorists, cyclists and pedestrians. Other roads suggested as potential areas for traffic calming or focused speed enforcement include 51st Street, 55th Street, 60th Street and Bradley Road.

Transit service in the Village is considered by many to be limited or inadequate, and most people who participated in stakeholder involvement activities have little direct experience with transit. Milwaukee County Transit Service's "Freeway Flyer" express service between the Marketplace Shopping Center on Green Bay Road and downtown Milwaukee is considered valuable, but service level cuts to the entire system are considered to have reduced its utility to residents.

Many stakeholders expressed strong interest in identifying opportunities to improve bicycle and pedestrian facilities. This emerged as a key theme of the public participation process. While some stakeholders expressed approval of the "suburban" feel in areas of the Village without

sidewalks, nearly everyone noted with disapproval the difficulty of getting around Brown Deer on foot or by bicycle. The expanding recreational trail system is considered a major asset to the Village. Participants strongly articulated a need to add sidewalks to the area surrounding the schools campus, along both sides of Brown Deer Road and to improve non-motorized transportation access to the Original Village area, the Marketplace, Bradley Road shopping areas, and to the Recreational trail.

Finally, parking availability is not an issue for Brown Deer stakeholders. In fact, a number of participants noted that there is surplus of parking at many Village commercial developments, which, when badly designed or poorly maintained, contributed to the "low grade" image that they feel much shopping in Brown Deer conveys. The list below includes qualities that residents currently appreciate about Brown Deer as well as challenges that residents feel Brown Deer *ought* to address in the future.

Strenghts

- Well-maintained
- Safe
- Bikeable
- Connected
- Bike path is exciting
- No congestion
- Sidewalks near schools
- Pedestrian safety
- Pleasant neighborhood and street environment

Challenges

- Hostile pedestrian conditions
- State control over Brown Deer and Green Bay Roads
- Fast traffic on Green Bay Road, 60th Street, and Brown Deer Road.
- Lack of bike and pedestrian connections to businesses, access to services
- Lack of sidewalks or pedestrian plan
- Confusing intersections
- Overbuilt intersections
- Open ditch drainage
- Wide roads
- Access to Original Village
- Too much land in parking lots
- No paratransit options
- No access to bike path
- Safe access to transit
- Access to River
- Hard to turn on/off of Green Bay Road
- Lack of connections between major land uses and nodes

4. DATA ANALYSIS

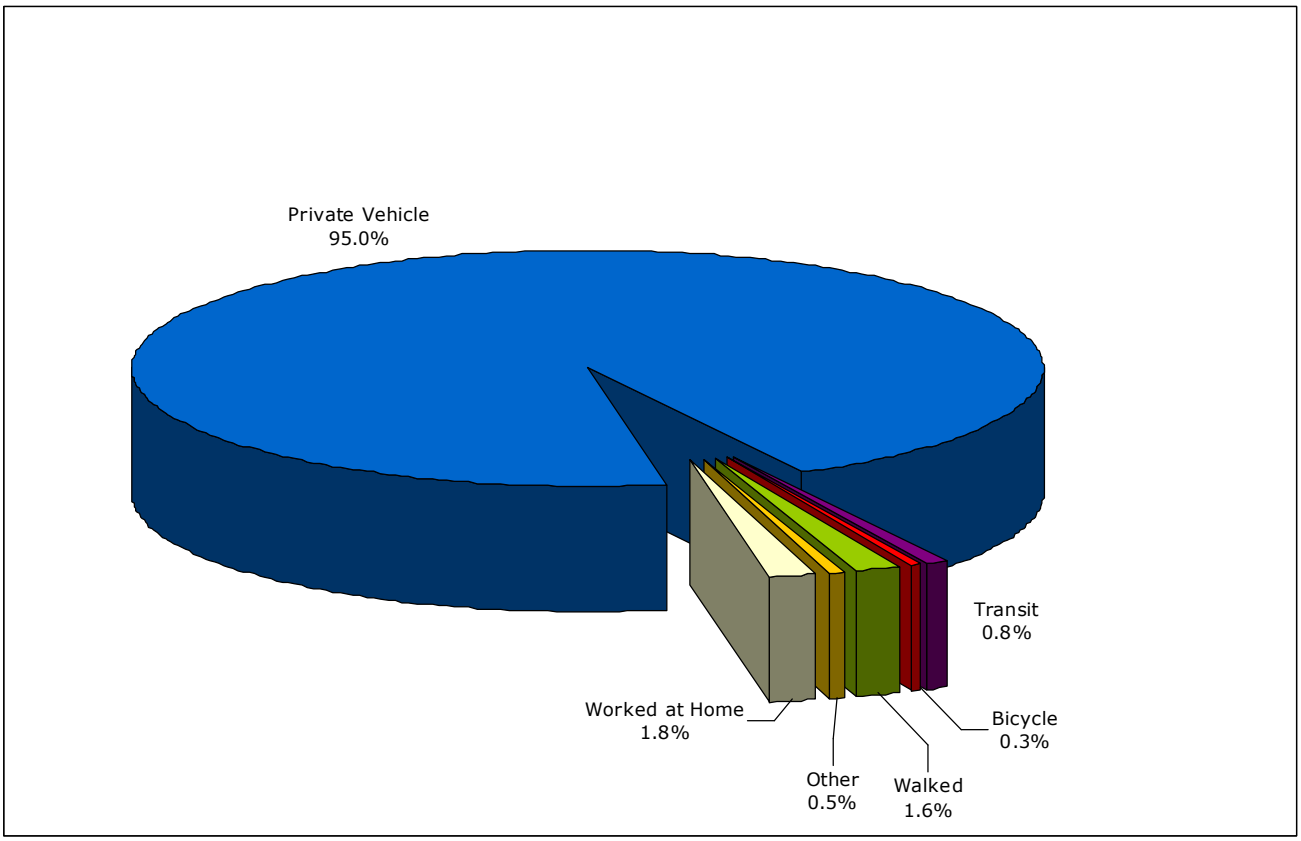
This section includes data on transportation use, facilities, safety concerns and demand in Brown Deer. The section is organized by mode: automobile, transit, pedestrian and bicycle.

4.1 Automobile Transportation Facilities and Characteristics

The private automobile is a key transportation mode in Brown Deer. Most of the Village was built out in the latter half of the 20th century, using a suburban development model focused on motorized transportation for mobility and access. Ninety-five percent of all work-related trips made by Brown Deer residents in 2000 were made by private automobile; and 90% of those trips were made by people driving alone (the other 10% participated in carpools). Figure 6.1 shows the distribution of work trips for residents.

The prevalence of automobile travel for Village residents is reflected in data showing the number of vehicles available to Brown Deer households. As shown in Table 6.1, a large majority of Village households – more than 95 % – have access to at least one vehicle, and nearly 60% of Brown Deer households have access to more than one vehicle.

Figure 6.1: Mode of Transportation to Work, 2000



Source: US Census 2000

Differences in vehicle availability are revealed when comparing homeowners to renting households. As shown in the Table 6.1, less than 2% of owner-occupied households have no access to a vehicle; this represented 71 Brown Deer households in 2000. For renters, this figure reaches 11%, or 164 households.

Table 6.1: Vehicles Available in Brown Deer, 2000

	No Vehicle Available	One Vehide Available	More than One Vehicle Available
All Housing Units	4.6%	37.1%	58.3%
Owner-Occupied Housing Units	1.9%	29.2%	68.9%
Renter-Occupied Housing Units	11.1%	56.7%	32.2%

Source: US Census 2000

4.1.1 Functional Classification of Roadways, Jurisdictions and Traffic Volumes

There are approximately 61.45 miles of roadway in Brown Deer. Of these, the vast majority by mileage – 46.20 miles – are local streets, providing access to land use and connections to the regional roadway system. There are 4.18 miles of collector roads in the Village, and 11.07 arterial miles. Primary collector routes are located on 51st Street, Dean Road. and short segments of Calumet Road and Beaver Creek Parkway. Major arterial routes through the Village include 60th Street, County Line Road, Bradley Road, Teutonia Avenue, Sherman Boulevard, Good Hope Road, Brown Deer Road, and Green Bay Road Table 6.2 details these characteristics.

Table 6.2 also details roadway jurisdiction in the Village. The State of Wisconsin has jurisdiction over 4.31 miles of arterial roadway over the entire lengths of Brown Deer Road (WIS 100) and Green Bay Road (WIS 57) in the Village of Brown Deer. There are three County Trunk Highways in the Village – Good Hope Road (County PP), Teutonia Avenue (County D), and Sherman Boulevard (County G) – encompassing 2.47 miles of arterial roadway. The rest of the roadways in Brown Deer, approximately 54.67 miles, are under the Village's jurisdiction, including all miles of local and collector roadways.

Traffic volumes on Village roads are generally in line with functional classification. Figure 6.2 graphically represents these relative volumes.

A general analysis of traffic volume trends in Brown Deer over the last three decades reveals rising traffic counts, with growth in volume leveling off on most roadway segments in the last decade as the Village has become built out and its residents have reached a mature stage in their family life cycles.

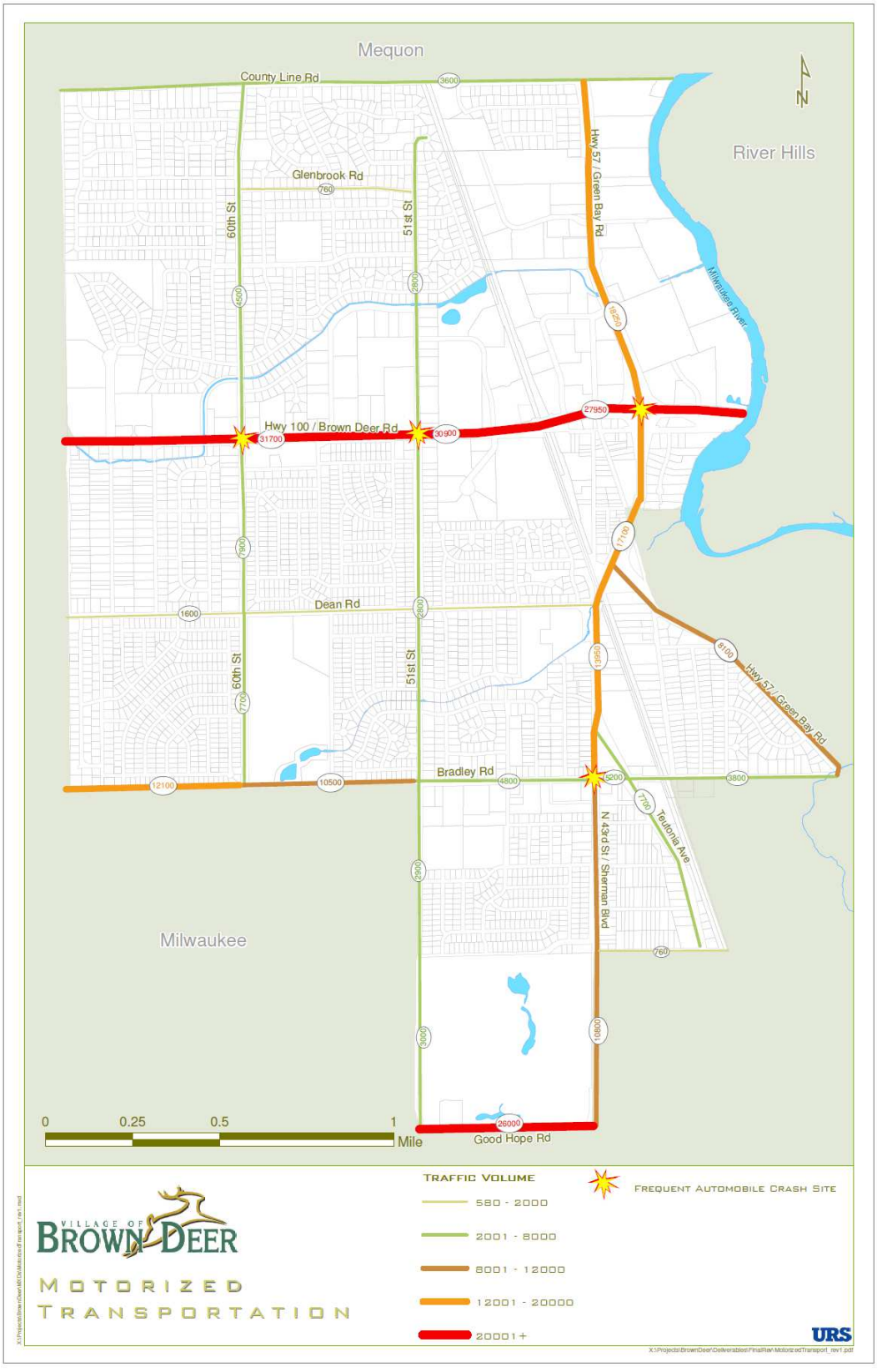
Most roadways have witnessed fluctuation in traffic volumes year-to-year within established ranges. A number of segments have

Table 6.2: Roadway Characteristics

Characteristic	**Miles**
Total	61.45
Arterial	11.07
Collector	4.18
Local	46.20
State	4.31
County	2.47
Municipal	54.67

Source: WisDOT

Figure 6.2: Motorized Transportation



Source: WisDOT (data from 2001, 2004, and 2007)

shown a decline in traffic volumes since 1998. Table 6.3 shows annual average daily traffic counts for select areas in the Village of Brown Deer in 2004 and 2007. Since 2004, traffic volumes have grown along the Brown Deer Road corridor, on Green Bay Road south of Brown Deer Road, and along Bradley Road. Traffic volumes in other areas of the Village have declined slightly, particularly for north-south travel on 60th and 51st Streets and Teutonia Avenue in the southern part of the Village.

Brown Deer Road (WIS 100) carries 30,000 vehicles on an average weekday.

4.1.2 System Maintenance

For the most part, the quality of the roads that the Village is responsible for maintaining is quite good. Very few people complained about road conditions during the public participation process.

Table 6.3: Average Annual Daily Traffic Counts for Select Locations, 2007

Roadway	Classification	Location	Vehicles per Day		
			2004	2007	Change
W. Brown Deer Rd.	Arterial	West of N. 60th St.	28,900	30,600	5.9%
W. Brown Deer Rd.	Arterial	East of N. Green Bay Rd	26,700	26,900	0.7%
W. Good Hope Rd.	Arterial	West of N. Sherman Blvd.	25,100	26,000	3.6%
N. Green Bay Rd.	Arterial	South of W. Brown Deer Rd.	20,000	20,300	1.5%
N. Green Bay Rd.	Arterial	South of W. County Line Rd.	16,500	16,200	-1.8%
N. Green Bay Rd.	Arterial	South of W. Bradley Rd.	10,400	11,700	12.5%
W. Bradley Rd.	Arterial	East of N. 51st St.	9,600	10,000	4.2%
N. Sherman Blvd.	Arterial	North of W. Bradley Rd.	9,200	8,600	-6.5%
N. 60th St.	Arterial	South of W. Brown Deer Rd.	7,200	7,900	9.7%
N. Teutonia Ave.	Arterial	South of W. Bradley Rd.	8,200	7,700	-6.1%
N. 60th St.	Arterial	North of W. Bradley Rd.	8,100	7,700	-4.9%
N. 60th St.	Arterial	South of W. Bradley Rd.	4,800	4,500	-6.3%
N. 51st St.	Collector	North of W. Bradley Rd.	2,900	2,800	-3.4%

Source: WisDOT

Approximately 85% of the local roadway miles, as reported by the Village to the Wisconsin Department of Transportation (WisDOT), are considered to be in fair condition or better, and over 65% of roads are in good condition or better. The Village assigns a numerical rating to each road segment, with "1" representing a roadway segment in need of reconstruction and "10" representing new construction. Table 6.4 details these ratings.

Table 6.4: WisDOT Road Segment Condition Ratings

1	*Failed*	Needs total reconstruction.
2	*Very Poor*	Severe deterioration. Needs reconstruction with extensive base repair
3	*Poor*	Needs patching & major overlay or complete recycling.
4	*Fair*	Significant aging and first signs of need for strengthening.
5	*Fair*	Surface aging, sound structural condition. Needs sealcoat or nonstructural overlay.
6	*Good*	Shows sign of aging. Sound structural condition. Could extend with sealcoat.
7	*Good*	First signs of aging. Maintain with routine crack filling.
8	*Very Good*	Recent sealcoat or new road mix. Little or no maintenance required.
9	*Excellent*	Recent overlay, like new.
10	*Excellent*	New Construction

Source: WisDOT as reported by Village of Brown Deer PASER ratings

Only 15% of the local road mileage in Brown Deer were rated "3" or below in 2007, as shown in Table 6.5, which lists pavement ratings by mile of roadway in Brown Deer.

One 500-foot section of Cedarburg Road was rated "failed" at that time. Most of the roads in Brown Deer that are classified as failed, very poor, or poor are located in the older portions of the Village, south of Brown Deer Road. Some of these local roads are clustered in the Original Village area. The Village of Brown Deer adheres to an ongoing roadway maintenance paving plan. Roadway improvement schedules and plans along with other major projects are detailed in Section 5: Transportation Planning Context.

Table 6.5: Pavement Conditions by Local Road Mileage, 2007

Rating	Description	Percentage of Total
1	Failed	0.2%
2	Very Poor	4.9%
3	Poor	10.0%
4	Fair	10.1%
5	Fair	9.2%
6	Good	12.9%
7	Good	22.0%
8	Very Good	11.0%
9	Excellent	10.3%
10	Excellent	9.5%

Source: WisDOT

4.1.3 Roadway Safety

According to data provided by the Brown Deer Police Department, an average of 219 automobile crashes occurred each year in the Village between 2005 and 2007. The total number of reported crashes increased approximately 10% in that time period. In general, however, the number of severe crashes leading to injury decreased slightly over the same timeframe. Approximately one-third of all automobile crashes in Brown Deer lead to injuries. Table 6.6 shows these figures.

Parking lots are the predominant location for traffic crashes in Brown Deer. About 17% of the Village's reported crashes have occurred in the parking areas of shopping centers, businesses and multi-family

housing complexes. Though most numerous, crashes in parking lots are less likely to result in personal injury compared to crashes at other locations.

Table 6.6: Reported Automobile Crashes, 2005-2007

	2005	2006	2007	Three-year Total	Annual Average	Change 2005-2007
All Reported Crashes	214	208	235	657	219	10%
With Injuries	80	74	73	227	76	-9%
% with Injuries	37%	36%	31%	35%		

Source: Brown Deer Police Department

More than 30% of the other traffic crashes in the Village occur along Brown Deer Road, especially where it intersects Green Bay Road, 51st Street, and 60th Street. Crashes at these locations are more likely to involve personal injuries due to high traffic speeds. Of particular note is the intersection of Brown Deer Road and Deerwood Drive. This intersection has averaged seven crashes annually since 2005, but nearly 60% of those crashes involved injury, making this the most dangerous high crash location in the Village. Many residents, staff and elected officials expressed concern with traffic speeds, safety and ease of use – and particularly with pedestrian safety– along the Brown Deer Road corridor.

Table 6.7: Prevalent Automobile Crash Locations, 2005-2007

	Three-year Total	Proportion with Injuries	Proportion of All Crashes
Parking Lots	113	17%	17%
Brown Deer Rd. and Green Bay Rd.	70	34%	11%
Brown Deer Rd. and 60th St.	53	40%	8%
Brown Deer Rd. and 51st St.	56	46%	9%
Brown Deer Rd. and Deerwood Dr.	22	59%	3%

Source: Brown Deer Police Department

Parking lots are the most prevalent location for automobile crashes in Brown Deer.

Other intersections identified by the Police Department as frequent crash locations include Brown Deer Road and Kildeer Ct. (an alternative entrance to the Marketplace Shopping Center east of Green Bay Road) and the intersection of Bradley Road and Sherman Boulevard. However, the three-year crash totals for these areas is much lower. With the exception of the intersection of Brown Deer Road and Deerwood Drive, all of these locations are signalized. Table 6.7 shows crash information from selected locations in the Village, and Figure 6.2 maps relative traffic volumes and frequent crash locations.

4.1.4 Trucks and Goods Movement

Within the Village, Brown Deer Road, Green Bay Road, and Good Hope Road are classified as truck routes by the Wisconsin Department of Transportation. Brown Deer and Good Hope Roads are designated as long truck routes. These truck routes allow the greatest range of trucking vehicles, and are the backbone for goods movement throughout the state. Green Bay Road is classified as a 75 foot restricted truck route, meaning that trucks longer than 75 feet are not permitted on the roadway.

4.1.5 Issue and Opportunity Locations

Several locations in the Village were identified as presenting particular problems or opportunities to enhance motorized transportation. These opportunity areas are desribed below and graphically depicted in Figure 1.5 in Chapter One: Issues and Opportunities.

- The intersection of Green Bay Road and Teutonia Avenue. This intersection is near the southern entrance to the Original Village area; it is considered by many stakeholders to be overbuilt and overly complex, making access to the area unnecessarily difficult.
- The intersection of Teutonia Avenue, Bradley Road and Sherman Boulevard. This five leg intersection is very large, requiring complex movements and decision-making. Its size and configuration are considered by some to hinder redevelopment of this area of the Village. Furthermore, Bradley Road may be underutilized for its width. There is some desire to redesign both Bradley Road (narrower, greener, perhaps with bicycle lanes) and the intersection, perhaps utilizing a roundabout design to free up land for redevelopment, simplify intersection navigation and improve safety.
- Brown Deer Road is considered both hazardous and unappealing by nearly all stakeholders who provided information. Traffic speeds are high – with posted speeds up to 40 MPH – and traffic volumes are high as well, making entering and exiting the roadway difficult. In addition, Wisconsin Department of Transportation officials are reluctant to allow the Village to improve aesthetics and wayfinding on this regionally important highway. There is a strong desire in the Village to enhance streetscaping, add identity signage for the community, and to improve the interchange between Brown Deer Road and Green Bay Road.

- Access to the Original Village. The Original Village area of Brown Deer is universally considered an asset to the community and a cornerstone for future economic development initiatives. However, the configuration of roadways and railroad right-of-way surrounding the Original Village makes access very difficult for those traveling by automobile, and nearly impossible for other modes. It would be desirable to redesign the access points to the Original Village to make entering and exiting the district safe and comfortable.
- Street connectivity in some areas of the Village. In the northeastern and north central areas of the Village, the system of cul-de-sacs and dead-ends, along with the railroad corridor, create conditions that some consider less than ideal. While the lack of connectivity contributes to low traffic volumes on residential streets, it also impacts provision of emergency services, increases traffic and congestion on arterial roads, and forces pedestrians and cyclists to travel on dangerous arterial roadways.

Source: Aerial pictures were taken from Google Earth

The intersections of Teutonia Avenue and Green Bay Road (left); Brown Deer Road and Green Bay Road (center); and Bradley Road, Sherman Boulevard, and Teutonia Avenue (right) are considered to present opportunities for redesign.

A Milwaukee County Transit bus picks up a passenger along Green Bay Road.

4.2 Transit Facilities and Characteristics

4.2.1 Bus Transit

Transit service in Brown Deer is provided by the Milwaukee County Transit System (MCTS). Countywide paratransit service is available through the MCTS TransitPlus program. As shown in Figure 6.1, only a small number of Brown Deer residents use transit to commute to work; approximately 0.8% of residents traveled to and from work by bus in 2000. Still, on an average weekday, data provided by MCTS shows that more than 900 people get on and off buses in Brown Deer. Standard adult transit fare in 2008 was $2.00.

Furthermore, Brown Deer's considerable population of renters is more likely to use transit than are homeowners. As Table 6.1 demonstrates, more than one of every ten renting households has no access to private transportation, and must rely on alternate modes to access work, shopping, school and other activities.

Four fixed transit routes serve Brown Deer. These transit routes are graphically depicted on Figure 6.3. Route 76 travels on 60th Street and Brown Deer Road. This is a major north-south route for MCTS, traversing the central portion of the county through the Cities of Milwaukee, West Allis and the Village of Greendale. In Brown Deer, Route 76 serves the school campus, retail shopping along Brown Deer Road, and connects to the regional retail shopping area at Granville Station (at 76th Street and Brown Deer Road in Milwaukee). Route 76 provides service to Brown Deer for 18 hours daily, from 5:30 a.m. to 1:30 a.m. At peak travel periods, the Route 76 buses traverse Brown Deer every 12 to 16 minutes. On an average weekday, 411 people get on or off of Route 76 at one of the route's eight stops in the Village. The most heavily used stops are located at 60th Street and Bradley Road, and on Brown Deer Road at 60th and 64th Streets.

Route 12 travels north and south in the Village's eastern end, via Teutonia Avenue and Green Bay Road. To the south, Route 12 travels all the way to downtown Milwaukee, a ride of one hour and six minutes during peak travel periods for a journey of approximately 13 miles. Route 12 serves the commercial and employment concentration along Green Bay Road north of Brown Deer Road, including the Marketplace Shopping Center and nearby business parks. The route also provides access to Brown Deer Park and the north side of the City of Milwaukee.

Figure 6.3: Multi-Modal Transportation

Source: MCTS, City of Milwaukee, Village of Brown Deer

Table 6.8: Average Daily Transit Ridership, 2008

Route 12

Stop Location	Av On	Av Off	Total Activity
GREENBAY / CHERRYWOOD	21	31	53
GREENBAY / RIVER'S EDGE (N9325)	10	2	11
GREENBAY / SCHROEDER DRIVE	23	29	52
GREENBAY / DEERBROOK (DEERWOOD)	73	81	154
GREENBAY / BROWN DEER ROAD	13	28	40
GREENBAY / RUTH	1	1	2
GREENBAY / DEAN	20	14	34
TEUTONIA / BRADLEY	13	15	28
TEUTONIA / PARKLAND	1	1	2
TEUTONIA / CALUMET	5	5	10
Total - Route 12	179	207	387

Route 76

Stop Location	Av On	Av Off	Total Activity
60 / BRADLEY	120	70	190
60 / TOWER	12	12	23
60 / FAIRLANE	1	1	1
60 / DEAN	4	13	17
60 / WABASH	1	6	7
BROWNDEER / 60	43	39	82
BROWNDEER / 64	25	31	56
BROWNDEER / 66	13	22	35
Total - Route 76	222	197	411

Source: Milwaukee County Transit System

Route 12 buses operate with 20 – 30 minute peak headways in Brown Deer from approximately 6 a.m. to midnight. The most heavily used of the route's 10 stops in the Village are all located north of Brown Deer Road, in an area of the Village characterized by large multi-family housing developments, a YMCA recreational facility, a large shopping center, and two business parks. On an average weekday, 387 people get on or off of Route 12 buses in Brown Deer. Table 6.8 shows ridership data for routes 12 and 76.

Route 49 provides Freeway Flyer (express) transit service to downtown Milwaukee from the Green Bay Road Park and Ride lot on the northeast corner of the intersection of Green Bay

Road and Brown Deer Road. This service operates with a limited schedule and passengers are charged a premium fare. A one-way trip from Brown Deer to downtown Milwaukee requires approximately 31 minutes, and the fare was $2.75 in 2008. This service operates weekdays with eight morning trips and ten evening trips, with headways of 10 to 25 minutes. Approximately 100 people access the Route 49 bus on an average weekday. During the school year, Route 49U also provides express service from the Green Bay Road Park and Ride lot to the University of Wisconsin-Milwaukee in the City of Milwaukee, and to the Milwaukee Area Technical College North Campus in Mequon. Service operates with irregular headways between 10 and 40 minutes from 6:30 a.m. to 10:30 p.m.

4.2.2 Other Transit Facilities

No passenger rail facilities are located in Brown Deer. The nearest train station is located in downtown Milwaukee, about 14 miles distant. General passenger air transportation is available at Milwaukee County's General Mitchell International Airport, approximately 22 miles to the south.

4.2.3 Issues and Opportunities for Transit

Due to macro-scale demographic shifts and the prospect of rising fuel prices, transit may become a more important factor in Brown Deer's transportation mix over the coming decades. Throughout the public involvement process, stakeholders, including senior citizens, expressed concern about the need to preserve mobility. An analysis of transit service and populations with higher demands for transit – renters, the elderly, and young persons – revealed the following issues and concerns in Brown Deer:

- There may be a growing need for crosstown (E-W) transit service on Bradley and/or Brown Deer Roads. There is a large area with a concentration of senior citizens located between the Village's two main transit routes, and not located within ¼ mile of a transit stop. Figure 6.4 shows this situation.
- Stakeholders identified hostile conditions for transit users near the intersection of Brown Deer and Green Bay Roads. A particular concern; the buses in this heavily traveled area leave and pick up passengers along high speed arterial roadways in areas with no sidewalks or street crossing protections.
- Walking connections to bus stops could be improved in some areas of the Village. The area west of 51st Street and north of Dean Road has a concentration of young residents who would benefit from safer and more convenient access to transit on 60th Street.
- A large population of senior residents are concentrated in the extreme NW corner of Village with difficult access to transit.
- Most large multi-family developments are located within a transit shed (i.e. within ¼ mile of a transit stop). However, a large concentration of jobs in the industrial area west of Village Hall are not within a transit shed.

- The access routes from transit stops to the Original Village area were identified as particularly difficult and unsafe to use, with no protection for transit users along Green Bay Road in the area south of Brown Deer Road.
- The schools and library are served by transit, as are the Village's main shopping areas, but other activity generators – such as Village Hall and most parks – are not accessible via transit.

Finally, discussions in southeastern Wisconsin are ongoing regarding the re-establishment of a commuter rail system for the region. One route that has been mentioned for this system and noted in the Southeastern Wisconsin Regional Planning Commission's "Regional Transportation System Plan for Southeast Wisconsin: 2035" would utilize the Canadian National rail line that travels north and south through Brown Deer. An opportunity for a station stop in the Village may arise at some point.

4.3 Pedestrian and Bicycle Facilities and Characteristics

Non-motorized modes of transportation represent a small proportion of total trips in Brown Deer, but occupy a large place in the community's list of concerns. Approximately 2% of residents' work trips were reported in the 2000 Census to be made by bicycle or on foot. Though these trips are likely undercounted – the Census asked respondents to report primary commute mode for a week in March, a timeframe not necessarily conducive to cycling and walking in Wisconsin – the personal automobile is likely to remain the dominant transportation mode in Brown Deer. As with transit use in the Village, it is likely that renters complete more walking trips than do homeowners, as more than one in ten renting households does not have access to an automobile.

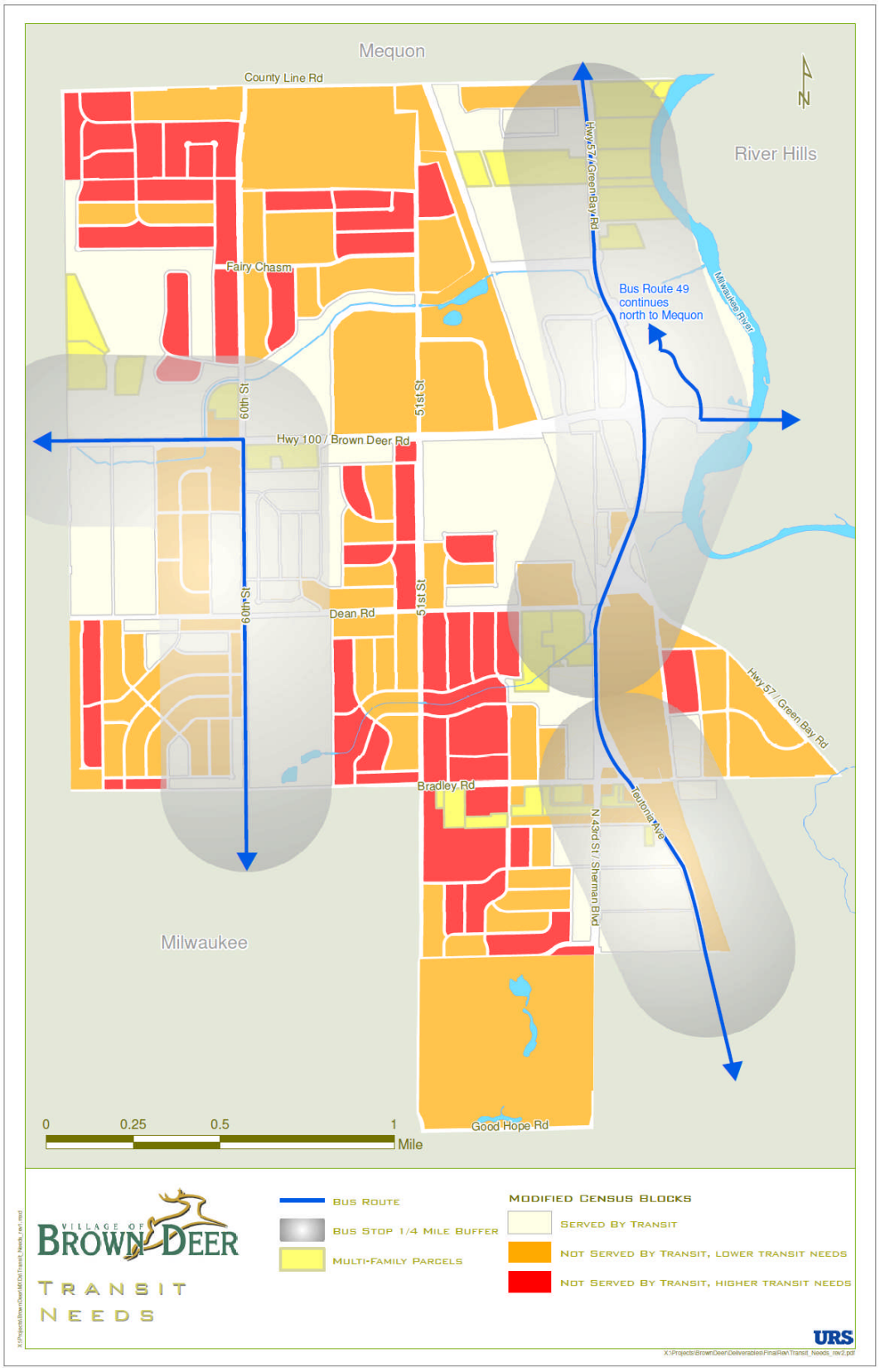
Stakeholders consistently requested an improvement in cycling and walking conditions in Brown Deer. Many identified areas in which walking or biking is difficult, dangerous and off-putting, and many said that improvements in non-motorized transportation facilities would improve the Village's quality of life and help attract new residents.

4.3.1 Pedestrian Infrastructure

Many roadways in Brown Deer are constructed without sidewalks. Many of the Village's residential streets are curvilinear or indirectly routed (i.e. not in an urban grid pattern). Traffic speeds and volumes on these streets are generally considered by stakeholders to be low enough to allow non-motorized modes to coexist with motorized traffic. Locations of the existing sidewalk infrastructure is shown in Figure 6.3. Along arterial roadways, sidewalks are primarily present on:

- the north side of Brown Deer Road through most of the Village west of Green Bay Road;
- the east side of 60th Street between Bradley Road and Brown Deer Road, and on the west side of 60th Street for one-half mile north of Brown Deer Road;

Figure 6.4: Transit Needs Analysis



Source: URS

- the west and east side of Green Bay Road for one-quarter mile between Deerwood and Schroeder Drives;
- On the west side of Sherman Boulevard for a one-quarter mile segment south of Bradley Road
- Along the south side of Dean Road between Edge O' Woods Drive and 60th Street, and for a quarter-mile section on the north side of Dean Road east of 46th Street
- On the north side of Bradley Road from 60th Street to Cedarburg Road, and along the south side of Bradley Road from 51st Street to Teutonia Avenue.

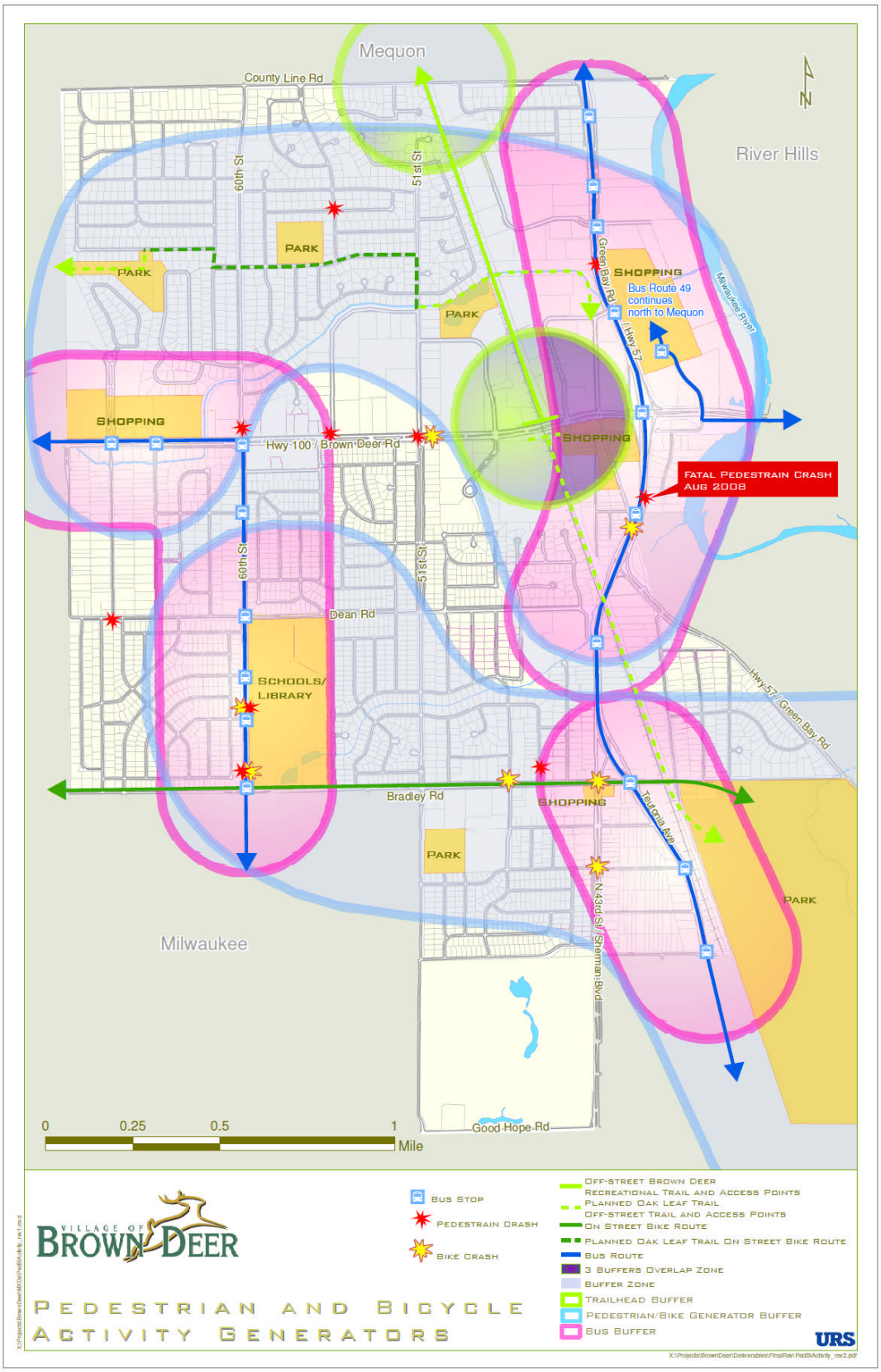
In addition, sidewalks and sidepaths are present around the circumference of the school campus, and sidewalks connect major arterials to business parks and to the manufacturing area north of Brown Deer Road and west of Green Bay Road. The Village currently provides snow removal on all sidewalks, and plans for expanding the network are prepared but have not yet been funded.

4.3.2 Bicycle Infrastructure

An off-street recreational trail runs through the Village from north to south along the Canadian National railway corridor/WE Energies utility corridor. It is currently paved from Brown Deer Road north to County Line Road, where it connects with the Ozaukee County Interurban Trail and points north. A paved extension of this trail will connect from Brown Deer Road south to Brown Deer Park, with the future goal of linking to other off-street segments that extend to downtown Milwaukee. Funding for the segment to Brown Deer Park has been programmed by Milwaukee County. The off-street trail is very popular among residents as noted during the public participation process. The Village and Milwaukee County have also worked to add a mixed on-street and off-street trail link that extends east-west from the existing recreational trail segment to Kohl Park. To create this link, the Village recently negotiated a level crossing of the rail line north of Village Hall into Village Park. This pedestrian and bicycle crossing will facilitate access to the trail north of Brown Deer Road, and its construction will provide a connection between the residential areas west of the rail line with the commercial and employment district to the east. Milwaukee County would assume maintenance responsibility and oversight of the off road trails segments south of Brown Deer Road and west of the railroad right of way as part of the Oak Leaf Trail system. The existing recreational trail will continue to be maintained by the Village.

In addition to the off-street trail, Bradley Road is a designated Milwaukee County Bicycle Route through its entire length in Brown Deer, however there are no designated on-street markings for this section and only sporadic posted signs. There are no other on-street paved bike lanes in the Village.

Figure 6.5: Pedestrian and Bicycle Activity Generators



Source: Village of Brown Deer, MCTS, WisDOT, and URS

4.3.4 Pedestrian and Bicycle Crashes

Between 2005 and November 2008, 17 crashes involving cyclists and pedestrians were reported to the police in Brown Deer. The locations of these crashes are shown in Figure 6.5. Four took place on 60th Street near the school campus, four along Brown Deer Road between 51st Street and 60th Street, three along Bradley Road near the commercial district at Sherman Boulevard, and three along Green Bay Road. In August 2008 a pedestrian was involved in a fatal crash on Green Bay Road, south of Brown Deer Road, in an area with no pedestrian facilities.

The Brown Deer Recreational Trail is scheduled to connect with a Milwaukee County Oak Leaf Trail extension south to the Village limits.

4.3.5 Issues and Opportunities for Non-Motorized Transportation

Generally speaking, conditions for pedestrians and bicyclists are uneven in Brown Deer; in some areas – such as along the off-street trail or in quiet residential neighborhoods – they are considered by stakeholders to be adequate or even exceptional. Many other areas are considered hostile to non-motorized transportation. Stakeholders strongly support the judicious improvement of walking and biking conditions in Brown Deer.

An analysis of non-motorized transportation activity is shown in Figure 6.5. This figure maps land uses that generate pedestrian and bicycle activity, including schools, parks, libraries, retail districts, transit stops, and dedicated bicycle facilities. These land uses are overlaid with a one-quarter mile buffer, the distance an average pedestrian can walk in approximately five minutes. The areas in which the buffers overlap indicate zones with higher levels of existing pedestrian and bicycle activity, and areas that may be prioritized for improvements. As Figure 6.5 shows, these areas are concentrated in the southwest and northeast quadrants of the Village. It is worth noting that the majority of the crashes involving cyclists and pedestrians in the Village have taken place in the areas expected to have the highest rates of activity. Priority non-motorized transportation opportunities include:

- Improve conditions for pedestrians and cyclists at high frequency crossing locations on arterial roads. These include Brown Deer Road at 60th Street, 51st Street, Arbon Drive, and to provide access to the Orignial Village from the north.
- The redesign of the school campus may provide opportunities to reconfigure pedestrian and bicycle connections to this major activity generator. Currently, the Brown Deer School District provides bus transportation to all students who live more than one-quarter mile from school. Safer connections could enable more students to access the school and the general public to access the library on foot or bicycle.
- The construction of additional off-street trail segments through the Village brings a number of opportunities to bridge barriers to non-motorized travel by ensuring adequate connections to the trail.
- Arterial roadways with relatively high traffic speeds and relatively low volumes, such as Bradley Road, 60th Street, 51st Street, Green Bay Road (near County Line Road) and Sherman Boulevard may be able to accommodate traffic calming, crosswalk improvements, adjusted signal timing to benefit pedestrians, or lane reconfiguration to better serve cyclists and walkers. These areas include concentrations of bicycle and pedestrian activity generators.

5. TRANSPORTATION PLANNING CONTEXT

Transportation planning in the Village of Brown Deer is undertaken by several agencies. In addition to the Village itself, these include the Wisconsin Department of Transportation (WisDOT), Milwaukee County, adjacent municipalities with shared facilities, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) and potentially the Southeastern Wisconsin Regional Transit Authority.

The Transportation Improvement Program (TIP), published every three to four years by SEWRPC lists projects for which funding has been programmed. In Brown Deer, several projects are listed in the TIP:

- Improve traffic signal timing on Brown Deer Road
- Asphalt overlay of Green Bay Road from Teutonia Avenue northward to the Village limits
- Pavement replacement on 60th Street from Bradley Road to Brown Deer Road (recently completed)
- Oak Leaf Trail bicycle and pedestrian connection between Kohl Park in Milwaukee and the Brown Deer Park

SEWRPC also produces a long-range transportation plan. Local transportation improvements involving regional systems that are consistent with this plan are well-positioned to successfully negotiate regional approval and funding processes. The planning commission's "Regional Transportation Plan for Southeastern Wisconsin: 2020," published in 1997, projected severe or extreme congestion on Brown Deer Road between 60th and 76th Streets. At the same time, the

plan called attention to the potential need for more transit service for the employment centers along Brown Deer Road. The update to that plan was completed in 2007. SEWRPC's "Regional Transportation Plan for Southeastern Wisconsin: 2035" studied congestion levels in the region and found that traffic on all major arterials within the Village is at or below design capacity. General recommendations for the region include increasing the frequency of bus trips, implementing new bus routes (including rapid bus service along Brown Deer Road in the Village), offering more variety of transit modes beyond the current reliance on buses, increasing bicycle facilities, improving the physical condition of roadways through maintenance, and, in some instances, expanding capacity through widening.

SEWRPC's "Milwaukee County Transit System Development Plan: 2009-2013" reveals areas of Brown Deer with higher than average transit needs, and residential and employment density that are underserved by transit. This is particularly true in the center of the Village. While additional transit needs have been identified, the County Transit System faces a financial crisis and has threatened service reductions in the Village.

The Wisconsin Department of Transportation (WisDOT), in pursuing changes to and maintenance of the state-controlled roadways in Brown Deer, notes that it intends to plan roadways to: limit direct access to major roadways, locate signals to favor through movements, preserve functional areas of intersections, limit conflict points, separate conflict areas, remove turning vehicles from through lanes, provide a supporting street and circulation system and provide community outreach. These objectives may be in conflict with the vision of Brown Deer residents and local officials for their roadway system, particularly with regard to local access and pedestrian and bicycle movements near the Brown Deer Road/Green Bay Road interchange. All parties will have to be cognizant of the potential for conflict as planning for the Village moves forward. WisDOT also recommends that the Village complete a bicycle plan to aid in future transportation planning coordination with the state.

Finally, as described previously the Southeastern Wisconsin Regional Transit Authority is exploring options for a commuter rail system; a spur on the Canadian National railway through Brown Deer has been mentioned, although current planning does not include this alignment in a start-up system.

6. Brown Deer Transportation Goals and Objectives

Goals	Objectives
1. The Village will make it easier to travel in Brown Deer on foot and by bike.	**1.1** Improve neighborhood and commercial access to Brown Deer Recreational Trail **1.2** Increase sidewalk network **1.3** Improve safety and convenience for pedestrians **1.4** Evaluate opportunities for on- and off-street bike facilities in public and private spaces **1.5** Increase awareness for multi-modal transportation opportunities
2. The Village will ensure safe and convenient travel by automobile and transit.	**2.1** Evaluate street and road connectivity **2.2** Support appropriate and sufficient bus transit service at or above current levels **2.3** Evaluate priority locations to improve safety by addressing high traffic speeds **2.4** Initiate with the Wisconsin Department of Transportation (WisDOT) and Milwaukee County the redesign of major intersections **2.5** Support and participate in local and regional planning efforts for commuter rail
3. The Village will improve the aesthetic experience for users of streets, intersections, transit stops and parking areas.	**3.1** Improve safety of Village thoroughfares through the development of streetscaping plans and standards in order to enhance the Village's identity **3.2** Improve gateways at major entry and exit points to the Village

7. Recommendations for Village Transportation Policy, Programs and Initiatives

Brown Deer has been noted as having an excellent program for maintaining local streets in a cost-effective and efficient manner, as well as excellent working relationships with neighboring jurisdictions, Milwaukee County and regional planning organizations with responsibilities for enabling transportation. The Village has exploited these healthy relationships in recent years to

improve conditions for bicycling and walking in Brown Deer, for improving local circulation, and for maintaining roadway safety. Village stakeholders have expressed a strong desire to continue to improve bicycle and pedestrian access, safety and facilities, and have identified specific intersections that could be improved for operational characteristics. It is assumed that the Village of Brown Deer will continue to pursue its general course in transportation maintenance and planning as detailed in this chapter.

1. Develop a bicycle and pedestrian plan for the village.

A comprehensive bicycle and pedestrian policy and development plan can guide future transportation investments in Brown Deer. An adopted plan will enable the Village to leverage transportation investments by the state and county within its borders to improve conditions for non-motorized transportation in accordance with the desires and priorities of residents. A plan could also aid the Village in applying for transportation enhancement grants, allocating Community Development Block Grant funding and in cooperating with neighboring jurisdictions. If undertaken in concert with the Brown Deer School District, such a plan could enable the Village to apply for Safe Routes to School grant funding for specific projects.

2. Develop a consistent policy for incorporating bicycle lanes into village street maintenance.

The City of Milwaukee provides an excellent policy model for automatically reviewing streets scheduled for resurfacing for their capacity to incorporate striped bicycle lanes into the design. Bicycle lanes have been shown to increase confidence among bike riders and to calm traffic. By evaluating streets on a series of engineering criteria and overlaying a bike lane appropriate cross section with the street paving plan, the Village may be able to cost-effectively provide a major bicycle facility upgrade on Village maintained roadways.

3. Develop bicycle parking standards for redevelopments.

For major redevelopments, or those which utilize public financing, it may be appropriate to develop standards for the provision of bicycle parking. The placement, capacity and design of bicycle parking has been shown to affect ridership rates, and if properly designed send a clear signal about the value of non-motorized transportation in a community — enhancing the Village's image — in a very cost-effective manner. The Association of Pedestrian and Bicycle Professionals has developed guidance on the provision of bike parking, culling best practices from around the country.

4. Enhance and develop key connections into the Original Village.

Stakeholders strongly support improved motorized and non-motorized access into the Original Village. Analysis supports physical improvements at several key locations. Developing gateways at Deerbrook Trail and Deerwood Drive would enhance the northern entrances to the district. At the south end of the Original Village, the Village could explore developing a short connector trail between Dean Road and the planned extension of the Oak Leaf Trail. The route is already in heavy use by pedestrian and bicyclists, as evidenced by desire lines worn in the grass, and

would pass under the railway trestle on the west side of Teutonia Avenue. A trail connection would provide safe access to the Original Village for the dense multifamily housing developments along Dean Road, as well as for the single family neighborhoods in the area. Finally, the Ruth Place entrance to the Original Village was repeatedly called out as inhospitable to travel by both automobile and other modes. This area presents difficulties in the short term, but should be considered at least for a gateway treatment. Over time, the entrance could potentially be reconfigured with an eventual redesign of the Green Bay Road/Teutonia Avenue intersection. Plans to improve infrastructure and aesthetics throughout the Original Village are under development by Village staff and consultants. The plans include gateway treatments, sidewalk connections, and stormwater management improvements, tentatively scheduled for 2010 and 2011.

5. Work closely with the Wisconsin Department of Transportation (WisDOT) on the redesign of the Green Bay Road/Brown Deer Road interchange.

The design of this key location in the Village largely determines the experience of many visitors to Brown Deer. Brown Deer Road is an arterial of considerable regional importance, and carries very high traffic volumes, but configured as is currently the case, the interchange in considered detrimental to the safety, access and quality of life in the Village. Its redesign represents a major opportunity to improve some aspects of the interchange. Village stakeholders strongly expressed a desire that this intersection be redesigned at-grade, a major change in roadway configuration that could open many opportunities for economic development, enhancing the Village's identity, improving safety for non-motorized transportation and most particularly improving access to the Original Village. WisDOT may be willing to work with the Village on aesthetic matters if the Village is willing to work with the State on access management issues in the corridor. Early and ongoing integration of planning is a key issue, as is working with state elected officials, so that the Village's priorities are clearly articulated.

6. Enhance connectivity throughout the village.

Stakeholders identified other areas with poor connectivity, particularly in the northeast corner of the Village and on either side of the Canadian National rail line. The Village could explore adding connections — as with the recently negotiated level crossing of the railroad tracks near Village Hall — as opportunities arise. This connectivity may be improved for bicycles and pedestrians through the use of easements. Such easements are routinely planned and implemented in Seattle and Vancouver, particularly at the ends of cul-de-sacs. They can be designed to allow passage by emergency vehicles should the need arise, which allows access but limits motorized traffic in residential neighborhoods. Priority locations could be identified through a bicycle and pedestrian planning process, and could focus on the northeastern quadrant of the Village, the area around the intersection of Green Bay and Brown Deer Roads, and other locations where travelers are forced onto arterial roadways, as well as locations undergoing major redevelopments. Access to transit stops, shopping areas, schools and parks as identified in Figure 6.5 should be prioritized.

7. Prioritize sidewalk improvements around the school campus and in the northeastern corner of the Village.

These areas generate high rates of pedestrian activity, and suffer from a discontinuous sidewalk system. Sidewalk design can be programmed into Village and state improvement planning relatively easily if the Village undertakes a pedestrian and bicycle plan. Improvements in the northeastern corner of the Village are particularly important as this area has a high number of overlapping pedestrian generators, including transit service, retail nodes and concentrated multi-family housing.

8. Consider a "road diet" for Bradley Road and other overbuilt roads in Brown Deer.

Often roads in the Village are too wide for traffic conditions and should be narrowed or "dieted" with can include reducing the number of travel lanes, incorporating turning pockets and providing space for landscaping improvements and bicycle lanes. Road diets have proved effective in improving safety and operations on certain types of urban roadways with average daily traffic volumes of less than 20,000. There are many examples throughout the country of successful road diets, including Lincoln Memorial Drive in Milwaukee. Bradley Road likely meets the criteria for a successful road diet, and could be evaluated for such a program. A redesign of the cross section of this roadway could provide an important east-west link in the Village's non-motorized transportation system, improved stormwater management, more attractive landscaping, safer and more consistent motorized travel and a major image upgrade for the Village. It would of course be most cost effective to plan a reconfiguration with regular street reconstruction. Other roads that should be evaluated for road diets are Dean Road, between 51st Street and Teutonia Avenue; Fairy Chasm Road, between 51st and 60th Streets; and 51st Street, between Beaver Creek Parkway and Woodland Drive.

9. Evaluate parking requirements for redeveloping areas.

The Village's parking provision requirements are not out of line with those of many surrounding communities, but stakeholders report that some areas seem to suffer from a glut of parking. Some cities enable easy reductions in parking requirements to spur redevelopment. These reductions may be based on access to transit — the City of Milwaukee allows a reduction of up to 30% in areas well-served by transit — or in coordination with the provision of bicycle parking, pedestrian access and possibilities for shared parking among compatible land uses. In addition, the Village could examine its on-street parking policy in redeveloping districts, especially in the Mixed Use District recommended in the Land Use chapter of this plan.

10. Explore with Milwaukee County redesigning the complex intersections on Teutonia Avenue.

The intersections of Teutonia Avenue with Bradley Road and Green Bay Road are considered confusing, hazardous and very large by stakeholders. As these intersections are scheduled for reconstruction in the future, the Village could work with the County to consider constructing

roundabouts or other modern designs. Such a redesign could provide for safer traffic movements, gateway opportunities, and the freeing up of land for redevelopment in tax incremental financing districts.

11. Develop a streetscaping plan for 60th Street, 51st Street and Bradley Road.

In conjunction with other recommendations in this plan and ongoing street tree canopy efforts, the Village can focus landscaping and streetscaping efforts on these roadways initially to enhance Brown Deer's image and build out the "Emerald Bracelet" envisioned in the Natural and Cultural Resources chapter of this plan.

12. Work with the Southeastern Wisconsin Regional Planning Commission (SEWRPC) and Milwaukee County to implement one of the alternatives in SEWRPC's Transit Development Plan that recommends increasing transit in Brown Deer.

At the time this document was drafted, SEWRPC was in the process of developing their "Transit Development Plan: 2009-2013." Thus far, no alternative has been selected as the preferred. Several alternatives, however, recommend increasing headway times for Route 76, which runs north and south on 60th Street before turning west at Brown Deer Road, and establishing a bus route along the entire length of Brown Deer Road. The industrial parks along Brown Deer Road, both in Brown Deer and in the City of Milwaukee, further west, represent large employment centers in Milwaukee County. Increasing transit service provides a reliable means of transportation to workers. Employers continually cite reliable transit as a key criterion when looking to relocate their business. In order to remain economically competitive within the region, Brown Deer must improve and expand transit access.

13. Work with the Milwaukee County Transit System (MCTS) on bus stop locations.

Currently, there are several bus stops in Brown Deer that are located in places that pose undue risk to transit riders getting on or off the bus. For example, the bus stop for Route 12 at Green Bay Road and Brown Deer Road drops passengers off on a small traffic island at the end of an interchange ramp. Passengers who need to cross the street must walk under the Green Bay Road overpass, an area with no sidewalks. Looking at data from MCTS, it appears that transit riders avoid this bus stop, instead opting to get off further north where conditions are less hazardous even if it means a longer walk to their destination. While changing bus stops can be disruptive to transit riders, the Village should work with MCTS to evaluate safety conditions at all bus stops and to make improvements as necessary. Stop location may be evaluated particularly with the needs of the elderly, youth and renters in mind as analyzed in this document.

14. Work with the Milwaukee County Transit System to evaluate site design of bus stops.

Currently, many of the bus stops in Brown Deer are poorly designed—lacking ramps, landing pads, shelters, benches, and connecting sidewalks—so that transit riders, especially the elderly and those with disabilities, have difficulty accessing bus stops. Furthermore, transit stop design offers the Village an opportunity to improve its identity by providing aesthetic and usability enhancements. Several resources on transit stop design are available from the Transportation Research Board (an arm of the National Academy of Sciences), and the City of Cleveland which has developed a well-regarded system for evaluating the adequacy of transit stops. The Village of Brown Deer has relatively few bus stops in it jurisdiction, and could evaluate their adequacy fairly easily, and program improvements to coincide with roadway or utility work.