PART III: PROTOTYPE DESIGN

These concepts and guidelines described earlier were used to develop a prototype design for an emerging suburban area located west of the City of Milwaukee. This was done to illustrate the concept and to test how the guidelines could be applied to a real world situation. The process of developing the prototype design and the guidelines occurred simultaneously and there was substantial modification of both as the project progressed. All members of the project team participated in the design process and the result represents the collaborative effort of all involved.

The design evolved through three stages. First, a theoretical design was developed to attempt to illustrate how the concept of a Transit Corridor District would look without site constraints. In the second stage, the initial prototype design was modified to address the conditions on a specific site. Finally, in the third stage, this design extensively critiqued and a final design was developed.
J. Theoretical Development

Theoretical Designs

Initial work on the project focused on the development of overall concepts and preliminary design work. The basic concept that emerged was a corridor based land use pattern following a transit route. Ideally the transit corridor would be located parallel to a primary highway arterial, but at least 1/4 mile away to create a zone of pedestrian access to the transit system. The starting point then simply was a line on a piece of paper representing a transit route. A 1/4 mile stop spacing was added along with a series of pathways to connect the stops to surrounding areas.

A one-half mile by one mile segment was developed next. This includes a central transit route and a local street and block pattern designed to provide direct walking paths to the individual stops. Higher density land uses (apartment buildings, offices, etc.) are placed directly along the transit route. At the center of the area a school is located near the transit stop with open space located behind it. A shopping center is also located at the center. It is different than a typical shopping center in that it occupies a long, narrow site. Transit-related shopping (neighborhood stores, etc.) is located nearest the transit stop while auto-related shopping is located along the auto arterial street. Green space is included along the pathway system to provide some open space and to somewhat isolate the noise of transit vehicles from surrounding areas. Four alternative street and block patterns were used in the quadrants of the area. These were located following the location of the pathways and reflect a desire to minimize walking by providing diagonal pathways. Different patterns were used in each quadrant to show the range of options that could be used.
PROTOTYPE DESIGN/INTRODUCTION

BASIC MILWAUKEE GRID
Local Street Patterns: Variation on a Grid

Another effort that provided some useful insight was to examine how a traditional grid street pattern could be modified to provide a transit-sensitive land use pattern. The basic "Milwaukee grid" was used as a starting point. This pattern is found in the older parts of the City of Milwaukee and has 16 blocks to the mile in the east-west direction and eight blocks per mile in the north-south. Arterial streets are designated every one-half mile leading to an area 1/2 mile on each side with 32 blocks. Each individual block is of a size of 660 by 330 feet (including street rights-of-way) and can contain 20 lots if the lots are 60 feet wide. This results in a residential density of 2560 lots per square mile or 5-10,000 persons per square mile with single family dwelling units and typical household sizes. Actual densities, of course, vary depending on other land uses, differences in lot sizes, household size and the presence of multifamily housing. Such a pattern provides a high density of land use that should be sufficient to support transit service.

Grid street patterns have significant problems in urban areas and are avoided by planners in modern land use design. Through traffic can be a significant problem since it is relatively easy to take shortcuts through residential neighborhoods and to avoid congested arterials by using parallel local streets. Residential or commercial lots that directly front along arterial streets also cause problems for traffic operations along the arterials because of conflicts with vehicles turning in or out of driveways. Another problem occurs if grid streets are placed in areas with difficult terrain. Gradients on streets become too steep as streets go up high slopes. Furthermore it can be difficult to locate building sites along steep streets. However, grid street patterns have some advantages when applied to transit-sensitive land use design. Pedestrian pathways can be direct and high residential densities can be developed.
PROTOTYPE DESIGN/INTRODUCTION

GUIDELINES FOR TRANSIT SENSITIVE SUBURBAN LAND USE DESIGN
Block size and spacing seems to be quite appropriate with transit service built around 1/4 mile walking distance and 1/4 mile block spacing. Thus it may be possible to adapt the grid pattern to deal with some of its problems and to better work with transit systems. Several variations on the grid were done to provide a framework for further design.

The first variation (A) attempts to control through traffic problems by shifting the interior streets by one-half block and closing off some connections to the arterial streets. Connections to arterials occur at the 1/4 mile points. The transit corridor is located 1/4 mile from the arterial street with stops located internally approximately 1/8 mile from the arterials on the edge. The central portion of the transit route is closed off to automobile traffic and pathways are used to provide connections to the transit stops. Other variations on this theme could involve more extensive use of cul-de-sacs (B) and loop streets (C). Diagonal streets could also be used internally to provide direct walking paths (D). The configuration of streets also depends on the general direction of the transit route relative to the grid. A transit route running parallel to the long side of the blocks would result in a different pattern of streets (E). In this case the transit route could be located entirely separate from the local street system or else it could be shifted one half block to follow the streets.

The placement of streets where two transit corridors cross presents interesting opportunities (F). Such a place would be a natural location for concentrated shopping and office activity. These areas could be spread along the two transit routes and it is likely that stops would be placed close together. The restriction of auto traffic opens up the center of the commercial area for extensive pedestrian movement and for public space for civic activities. Parking for automobiles could be provided along the outside of the commercial district on all sides along with good access from the surrounding arterial streets. Further variations are possible,
especially the introduction of curvature in the street pattern and the reduction of symmetry. The basic structure of streets, however, should include location of the transit corridor and stops to provide good pedestrian and bicycle access and to control automobile movement to avoid interference with safe and efficient transit and pedestrian circulation.
K. Site Description

Selection of the Project Site

To test our guidelines and concepts a prototype design was developed for a suburban area. The site chosen is one-half mile wide by two miles long and is located west of the City of Milwaukee in the Township of Menomonee Falls. The area is rural in character with little development. However, urban development activity is occurring south and north of the site and it is likely that it will see a transition from rural to suburban land use in the near future. It lies north of the City of Brookfield and south of the Village of Menomonee Falls, both of which have had substantial suburban development during the past twenty years. To the east is an industrial district while three miles to the west is the rapidly growing Village of Sussex.

The site chosen is parallel to Silver Spring Drive, a major east-west arterial which connects to the U. S. Highway 45 belt freeway two-and-a-half miles east. The comparable arterials located to the south (Capitol Drive, North Avenue, and Blue Mound Road) have been sites of substantial commercial strip development. The selection of this site was based on its potential for future suburban development activity. In addition, it appeared to be a potential location of transit services which could connect into the Milwaukee central area and provide an east-west crosstown service into the City of Milwaukee. Because the site is relatively undeveloped and has relatively few owners, there are opportunities to provide concentrations of demand that could create a significant market for transit services. Finally, the site has a mixture of rolling terrain and natural features which could be incorporated into the design.
Site Conditions

The site consists of gently rolling hills with no significant slopes which would impede development. Current use is agricultural with a few scattered residences. There is a large wetland located in the northwest corner of the site. There are some wooded areas in the site, primarily in the form of mature fence rows with some larger wooded tracts in the south-central and west portions of the site. Land ownership is primarily in large parcels up to 80 acres in size. The east edge of the site is along Pilgrim Road, a major north-south arterial in Waukesha County which connects the Village of Menomonee Falls with a major regional shopping/office center at Brookfield Square to the south. The next north-south street is Marcy Road, one-and-one-half miles west. Marcy Road is two miles long and does not directly continue across the county. Another major arterial, Calhoun Road, a mile west of Pilgrim Road, could potentially be extended through the site in the future.
PROTOTYPE DESIGN/SITE

Transit Service

It was assumed that there would be two transit routes that would intersect in the district. An east-west line that parallels Silver Spring Drive and a north-south route that connects the suburban centers of Menomonee Falls and Brookfield Square. Our primary emphasis is on the east-west line, which could be extended westward an additional two miles before it would encounter existing development and have to be rerouted to along Silver Spring Drive. The intersection of the two routes presented an opportunity to create a town center for shopping and office activity built around the transit services. No substantial shopping districts exist nearby and this appeared to be a logical use which would work well with the transit service.

The east-west transit route was located roughly 1/4 mile south of Silver Spring Drive. The route was located to avoid steep gradients and to parallel fence line wooded areas so they could be used to enhance the corridor. The north-south route was assumed to be along a corridor that passes through open space north and south of the site, eventually connecting with Pilgrim Road and/or Calhoun Road. A north-south transitway intercepts this site in its "downtown" area. This line connects the Brookfield Square/Blue Mound Road, a strong area of suburban employment and shipping, with the growing Village of Menomonee Falls, north of the district. Other route locations in this area which were not selected include areas of wetlands, parks and quarries, built-up areas and areas of outstanding natural beauty.

Transit stops were located approximately every 1/4 mile along the corridors with a closer spacing in the town center. Generally stops were located 1/8 mile in from crossing arterials to provide for reduced walking distances to transit. Some modifications of stop locations were made to take advantage of site conditions.