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thesis 1986-87
college of architecture • ball state university
acknowledgements

THESIS CHAIRPERSON............J. Robert Taylor
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A special thanks to: James and Lorene Bailey
                      Kris Hoyer
                      Ken Summers
                      Jack Daniel
                      Tony Costello

Toledo Area Chamber of Commerce
Toledo-Lucas County Public Library
Hoosier Dome--Indianapolis
Riverfront Stadium--Cincinnati
THESIS "A multi-use professional sports stadium can serve as a catalyst to bring vitality back to an urban fabric."

Many cities with dying downtown areas have turned to the stadium as a means by which to reverse their decaying trends. With a stadium and its pro teams and personalities come the benefits of attracting people, business, and money. This has proven successful in many cases to a point. However, many times the full potential of this attracting power is not fully realized because of a suburban location or a narrow vision of scope. Most of the newer stadiums have no strong connections with the urban fabric and seem to just float in a sea of parking lots. These great buildings then become cold and lifeless during non-event times and are disappointing as important landmarks. However, if carefully integrated into the surrounding environmental fabric, a stadium can become a hub for life and activity, spurring on new developments and urban improvements.

PROJECT This project is the design of a multi-use stadium for downtown Toledo, Ohio with the hypothetical situation that they will have a series of professional sports teams. Toledo is located at the mouth of the Maumee River on Lake Erie in northwest Ohio. It was once an industrial power and trade center. As Toledo is now reclaiming its river-edge lands from industry that is becoming less dependent on waterfrontage, an exciting urban riverfront park development is under way, bringing life and new business to the downtown area. By tying into the new riverfront development, a multi-use stadium will tremendously boost the activity needed to bring "vitality" back to the downtown.
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issues and concerns
HISTORY

Stadiums are distant cousins of such early man-made structures as the Greek amphitheatre. These amphitheatres incorporated seating into large, natural bowl forms in the landscape. From their seats the spectators not only took part in the performance, but also experienced the surrounding landscape. By Roman times, the stadium cousin was the coliseum. This was a much larger and more complex building than the open amphitheatre and was actively integrated as a civic monument into the urban setting.

In recent American history, the stadium has evolved from the humble ballpark. In the early 1800's, baseball and various bat-and-ball games were popular recreational pastimes of newly independent Americans. Organized contests between neighboring towns became frequent, and regular clubs soon developed. These games were played in large open fields with very few, if any, architectural features.

By the 1860's, baseball was in a new era with the rules well established and professional teams beginning to organize. On May 15, 1862, William Cammeyer opened the first enclosed field for baseball playing. Wooden stands were built to accommodate the increasing crowds.

Baseball grew in popularity and became big business. Teams now had owners, business managers, captains, and paid players--and most importantly--paying fans. Money was the motivating factor behind the development of professional sports, and the ballpark, which generated the revenue, began to assume paramount importance.
FIRST STADIUMS In 1909, Connie Mack Stadium, the first ballpark constructed of concrete and structural steel, was opened in Philadelphia. By the end of the 1910 season, Pittsburgh, Cleveland, and Chicago had new concrete stands.

Baseball can hardly be said to be the first modern mass spectator sport. Both horse racing and boxing drew large crowds. But from the economic standpoint, baseball built the foundation of professional team sports and the building of stadiums. At a time when American industry and ingenuity were just beginning to flex their muscles, baseball proved to be the ideal medium for testing and perfecting the techniques of sports merchandising. The stadium was responsible for changing the game from a sport to a business.

Concession concepts, scorecards, the sale of telegraphic rights, vending of souvenirs, off-premises production of collectible items, and press coverage of sports events were all developed around the stadium and its ability to produce the primary source of revenue: ticket sales.

The ballpark created overhead that had to be met, but it also created a way for entrance to the grounds to be controlled. This produced an environment in which things of value could be sold—choice seats, refreshments, programs, and souvenirs. In today’s stadiums, such concessions are vital in the economic picture, often being the factor between profit and loss.
DEVELOPMENT During the stadium's development, owners introduced other sports besides baseball as sources of additional income. Professional football leagues were formed by baseball owners to generate income during the off-season. The familiar warning track in baseball is a left-over from bicycle racing tracks that were introduced into ballparks during the bike craze of the 1890's. Many parks were also converted for use as horse racetracks. So the concept of "multi-use" stadiums is not new to today.

The ballpark also came to affect and change the nature of the game of baseball. As capacity crowds became a goal of the owners with parks on fixed pieces of property, the outfield acreage was reduced, thus, shrinking the ballpark and moving the outfield fence in closer to the hitters.

The low-scoring, defense-dominated game became offense-oriented with the thrill of the homerun. Every player now had the possibility of hitting one over the new 400 ft. fence as opposed to the previous 600 ft. and plus fences.

Historically, the stadium's development saw several phases. First, there were the open fields of amateur sports. In the 1860's, the enclosed wooden ballpark was introduced. Striving for more prestige and permanence, the stadium then saw the era of concrete and steel stands beginning in 1909. In the 1960's, stadiums entered the awe-striking age of the massive superstadiums. In taking the superstadium a step further we are now in the era of the environmentally enclosed "domed" stadiums.
LOCATION During all of the developments of the stadium, property values remained a prime factor in location and construction. The early stages saw the ballpark located on the outer edges of the urban center to utilize cheap real estate. As baseball gained in popularity and became a commercial venture, the ballpark moved closer to key public transportation and nearer to the center of the urban area from which it drew its crowds.

These early stadiums many times saw the city grow around the ballpark and create an "inner-city park." Such parks as Ebbets Field and Connie Mack Stadium had a special character and integration with its surroundings.

Then as America fell in love with the automobile and the independence that it gave the individual, parking became a tremendous problem with the inner-city ballparks. Everyone had to drive their own car to the game. Owners were afraid of losing fans if parking was not provided abundantly and close to the stadium. Eventually, the fans came to demand this. Thus, a trend was created to move the ballpark away from the urban center and surround it with enormous, inexpensive space for parking the private car. These stadiums suffered severely from a lack of character that the previous ballparks possessed. They seem cold, lifeless, lonely, and uninviting.
Today, the trend seems to be reversing and stadiums are again being built closer to the city centers. Riverfront Stadium in Cincinnati and Three Rivers Stadium in Pittsburgh were the first to make the move back. These new stadiums were physically closer to the downtowns, but they still lacked a successful connection with their surrounding fabrics. The newest wave of stadiums such as the Hoosier Dome in Indianapolis, regard parking and traffic with an attitude of less importance and place the value in the stadium’s strong relationship with the downtown area.
PROBLEMS  Stadiums, good or bad, with professional teams, good or bad, are powerful attractors. They generate their own traffic habits and surrounding developments, and ultimately affect the composition and wellbeing of the surrounding neighborhoods and areas.

This is where most stadiums are unsuccessful. The vision of scope was only focused on the stadium itself and not on the entire environment. When the surrounding areas were neglected, they suffered and decayed. This then has often turned the blade to cut the other way, and the negative neighborhood affects the usefulness and attractiveness of the stadium.

BENEFITS  If the stadium is carefully integrated into its environment, the two will be able to positively work together. An immutable fact is that stadium operation is risky business and often, per se, not profitable. But the economic value of stadiums must be looked at and measured in other terms. Stadiums have great worth in civic unity—they are where the people of a city come together to share a single event. They are sources of great pride. No matter how a visitor comes to town, he will more than likely see the stadium. And if by some freak chance he misses it, some one will surely point it out to him. It is an important landmark within the city, landmark within the city.
Stadiums are also sources of continual national exposure for cities via the press. A stadium is often the only image one has of many cities across the country. Many people can only "visit" by means of watching sports events on their television sets. And finally, although they may not financially be independently profitable themselves, stadiums often generate incalculable revenues for their cities. They are magnets that draw people and money, boost business, increase tax revenues, spur on other developments, and generate money for broader urban improvements.

**The Stadium**

At the heart of stadium design is the relationship of the spectators to the field. In baseball, fans want to sit along the foul lines or behind homeplate. In football, fans all want to sit on the 50 yard line. The goal is to put the maximum number of seats on the side lines. In either sport, the seats have to be sculpted, and extra rows must be put in the most desirable areas.

There is little dispute over the desired stadium layouts for either sport. A baseball field wants to lie between a vee. A football field wants to lie at the bottom of a valley. The problem lies in combining the two sports into one stadium. A multipurpose stadium must encircle the field in an attempt to provide something for everybody. The issue becomes one of "compromise." It is difficult to get the maximum seats for both sports in the same location.
BUILDING FORM A circular stadium puts the fans for both sports in good locations. However, they are sometimes a long way from the field. A psychological ploy here can help. Place the first row of seats as close to the field as possible, then regardless of how many rows there are, the last row seems closer. Square or polygon layouts sometimes get the fans closer to the field but often at strange angles and bad sight lines. Then there is the octorad, a combination between the circle and the square. This solution does not make seating a whole lot better and can lead to major construction problems.
MOVABLE STANDS The different requirements of baseball and football (and any other sport that the facility must accommodate) have made movable seats almost a necessity. This mobile situation takes away a considerable amount of "compromise." The movable stands can adjust the same stadium into very comfortable and functional configurations for several different situations. One requirement of the movable stands is that they must be moved easily and quickly. The seasons of the conflicting sports overlap and often require a change of stadium configuration within one day.

Generally, the structure of the lower seats has been set on wheels of some sort. Sometimes the wheels ride on tracks which intrude on the playing field, or sometimes the seating is broken into smaller sections and set on truck wheels. Often these solutions are time consuming and require a large crew.

Perhaps the best solution to movable stands is the new air-floatation system. This system utilizes large fans and a flexible skirt to contain air underneath the stands. The stands would be lifted up off the ground and easily towed to a pre-determined location. The stands would be moved quickly without the use of tracks or friction over any surface. The air-floatation system is insensitive to irregularities or cracks in the ground plane and uses the same principal that is used for Hover-craft vehicles.
PARKING: Just as important as the design is for circulation through the concourses and ramps of the stadium, the designer must provide for the car as well as for people. The problem is that the fans arrive to the game over several hours before the start, but they all want to leave at the same time.

The easiest parking solution is in the suburban stadium where there is room to spread the parking out around the stadium. But this can lead to an inhumane context. In downtown situations the multi-story parking structure is essential. It can also be used for shopping and business parking when there are no games scheduled. Non-event parking is paying off in many cases in defraying the additional construction costs.

In suburban stadiums, over 90 percent of the crowd arrives at the stadium by car. But in stadiums built near the city centers, much of the parking is absorbed in the downtown central business and shopping district, and many of the fans arrive at the stadium as pedestrians. This takes a big load off of the traffic situation immediately after the game and gives the game goers the added benefit of having an urban experience. Developers and planners should take advantage of these fans-on-foot and accommodate them and create businesses to cater to them along their paths. This will increase city revenues, reinforce a sense of place, and encourage frequent attendance of games.

Parking, however, can be designed for only after a serious and complex study is done of traffic routes, estimated volumes, surrounding neighborhoods, pedestrian routes, traffic generators, nearby businesses, future development, etc.
I am not sure about the next steps and how we should proceed. It must be a multiple-choice question. I am thinking about the approach and the timing. I am unsure whether the stadium is ready for the game. I am also wondering if we should be focusing on the players or the fans. I am not sure about the seating arrangements. I am thinking about the atmosphere. I am also uncertain about the weather conditions. I am wondering if we should be looking at the scoreboards or the screens. I am not sure about the impact of the game on the fans. I am wondering if we should be focusing on the players or the audience. I am thinking about the strategies for the game. I am also wondering if we should be looking at the advertising or the sponsors. I am not sure about the impact of the game on the community. I am thinking about the strategies for the future.
TOLEDO, OHIO Since Toledo was founded, the Maumee River has played a crucial role in its history and growth. Many of the great cities of the world are located near waterways because of their commercial and industrial value and for the beauty and recreation that water can give a community. Too often, however, the industrial aspects have won out over aesthetic and enjoyment values, and except for a few areas, these waterways have become unsightly, highly developed routes of industry and commerce.

So was the case in Toledo. As Toledo grew from a trading post to a major industrial city, the Maumee River and Lake Erie served an important and necessary industrial role. However, in more recent times industry has become less dependent upon waterway frontage. Now, those industries that require water access can take advantage of the strategic points along the Maumee provided by the Port of Toledo and industrial centers.

There is promising new potential for the city of Toledo as large tracts of river-edge lands open up and become available for new uses. Toledans can now begin to look to the river and explore the possibilities for redeveloping the river lands to serve a full range of public needs and improve the quality of the living environment.

The pride of the people of Toledo and their concern for the revitalization of the downtown is evident in the vast environmental improvements and new, successful developments that have taken place within the past decade. Many new public and private businesses have drawn to the downtown areas by Promenade Park and the soon to be realized International Park. Many individuals, civic groups, and public officials have devoted themselves to preserving and taking advantage of the city's magnificent waterfront setting—and to transforming Toledo into one of the notable lake and river cities.
<table>
<thead>
<tr>
<th>City</th>
<th>Miles</th>
<th>Time</th>
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<tr>
<td>Baltimore · MD</td>
<td>500</td>
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<tr>
<td>Buffalo · NY</td>
<td>300</td>
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<tr>
<td>Chicago · IL</td>
<td>230</td>
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<tr>
<td>Cincinnati · OH</td>
<td>200</td>
<td>4:10</td>
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<tr>
<td>Cleveland · OH</td>
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</tr>
<tr>
<td>Detroit · M1</td>
<td>60</td>
<td>1:15</td>
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<tr>
<td>Indianapolis · IN</td>
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<td>Milwaukee · WI</td>
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<tr>
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<td>11:00</td>
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<td>Pittsburgh · PA</td>
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<td>Toronto · ON</td>
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</tr>
<tr>
<td>Washington D.C.</td>
<td>400</td>
<td>10:00</td>
</tr>
</tbody>
</table>
Location of Site in Downtown

Toledo Sports Dome

Woodlawn Cemetery

Park

Forest Cemetery

River

CONSAUL

Ft. York

CONS

Navarre 

Navarre 

S. Co
Location of Site in Neighborhood
View looking southwest to downtown
**S.7 and S.8**

1. Residential - lower middle class
2. Railroad yards - heavy use, long term
3. Small commercial - decaying area
4. Short term industrial train and truck parking
5. Vacant railroad yards

**S.9**

1. Bestwick Braun building - soon to be the Toledo World Trade Center (1980's)
2. Toledo Edison Steam Plant - designed by Daniel Burnham - soon to be the world's largest museum for pop art (1980's)
3. Federal building and Post Office (1950's)
4. Toledo Trust Bank headquarters (1970's)
5. Owens Corning Fiberglass tower - corporate headquarters (1960's)
6. Toledo Trust building - designed by Daniel Burnham - first skyscraper in Toledo (1930's)
7. Toledo Edison headquarters (1970's)
8. Owens Illinois tower - last significant skyscraper built in the country before the depression (1930's)
9. Hotel Sofitel (1985)

**S.10**

6. Original downtown center of 1800's
7. Downtown center - mix of new and old
8. Promenade Park area
9. Vacant industrial tract
10. Start of International Park development
11. Seagate Office Building (1980's)
13. Middlegrounds (project site)
16. Boat Basin - docking space for two tour riverboats and a permanently moored restaurant-riverboat
17. Overlook and Owens Illinois plaza
1. Union Station train depot - 40's modern
2. High Level Suspension Bridge - 1933
3. Farmer's Market
4. Bostwick Braun - 1880's warehouse to soon be the Toledo World Trade Center
5. Fort Industry Square - restored 1880's commercial buildings to professional offices
6. Radisson Hotel - under construction
7. Holiday Inn Hotel - 1960's modern
8. Seagate Convention Center - under construction
9. Commodore Perry Hotel - 1910's
10. Owens Corning Fiberglass headquarters - 1960's modern
11. Owens Illinois tower - 1930's art deco
12. Toledo Trust building - 1890's Daniel Burnham
13. Toledo Edison headquarters - 1970's modern
14. Federal Building - 1950's modern
15. Toledo Trust Bank head office - 1970's modern
16. Toledo Edison Steam Plant - 1880's Daniel Burnham
17. Portside Festival Marketplace - 1984
18. Hotel Sofitel - 1985
20. Seagate office building - 1980's

21. Toledo Blade Newspaper - 1910's
22. Toledo Eleven Television - 1970's
23. Cherry Street Drawbridge - 1980's
View looking northwest to downtown
View looking west to site
1. From Interstate 75
2. From Summit Street
3. From the high-level bridge and up-river
4. From the highest point
5. From Promenade Park
6. From the Cherry Street bridge and down-river
7. From International Park and across the river
Special Features of the Site

- High-Level Suspension Bridge
- Swan Creek
- Maumee River
Sun Path Diagram - 40° north latitude
### Climatic Data - Northwestern Ohio

<table>
<thead>
<tr>
<th>Solar</th>
<th>Mean percentage of possible sunshine: 50%</th>
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<tbody>
<tr>
<td></td>
<td>Mean total hours of sunshine: 2400 hrs.</td>
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<tr>
<td></td>
<td>Mean daily solar radiation (langley's): 336</td>
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<tr>
<td></td>
<td>Mean sky cover, sunrise to sunset (tenths): 6</td>
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<table>
<thead>
<tr>
<th>Temperature</th>
<th>Mean number of days max. temp. of 90°F and above: 12</th>
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<tr>
<td></td>
<td>Mean number of days min. temp. of 32°F and below: 121</td>
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<tr>
<td></td>
<td>Mean date of last 32°F temp. in Spring: April 30</td>
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<tr>
<td></td>
<td>Mean date of first 32°F temp. in Fall: Oct. 20</td>
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<tr>
<td></td>
<td>Mean length of freeze-free period between Spring and Fall: 180</td>
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<td></td>
<td>Normal annual total heating degree days (base 65°F): 6,495</td>
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<table>
<thead>
<tr>
<th>Precipitation</th>
<th>Normal annual total precipitation: 32&quot;</th>
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<tr>
<td></td>
<td>Mean annual total precipitation: 33.85&quot;</td>
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<tr>
<td></td>
<td>Mean number of days with .01&quot; or more of precipitation: 144</td>
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<tr>
<td></td>
<td>Mean annual total snowfall: 36&quot;</td>
</tr>
<tr>
<td></td>
<td>Mean dewpoint temperature: 40°F</td>
</tr>
<tr>
<td></td>
<td>Mean relative humidity: 75%</td>
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<table>
<thead>
<tr>
<th>Winds</th>
<th>Prevailing direction and mean speed Dec - 13 MPH 45° northeast</th>
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<tr>
<td></td>
<td>June - 10 MPH 45° northeast</td>
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1985 TOLEDO TRADE AREA POPULATION

<table>
<thead>
<tr>
<th>County</th>
<th>Population</th>
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<tbody>
<tr>
<td>Total Trade Area</td>
<td>1,237,000</td>
</tr>
<tr>
<td>Defiance County</td>
<td>40,400</td>
</tr>
<tr>
<td>Fulton County</td>
<td>39,500</td>
</tr>
<tr>
<td>Hancock County</td>
<td>64,900</td>
</tr>
<tr>
<td>Henry County</td>
<td>28,500</td>
</tr>
<tr>
<td>Lenawee County</td>
<td>89,300</td>
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<tr>
<td>Lucas County</td>
<td>464,500</td>
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<tr>
<td>Monroe County</td>
<td>135,000</td>
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<tr>
<td>Ottawa County</td>
<td>40,600</td>
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<tr>
<td>Putnam County</td>
<td>33,500</td>
</tr>
<tr>
<td>Sandusky County</td>
<td>64,600</td>
</tr>
<tr>
<td>Seneca County</td>
<td>61,900</td>
</tr>
<tr>
<td>Williams County</td>
<td>37,200</td>
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<tr>
<td>Wood County</td>
<td>114,400</td>
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<tr>
<td>Wyandot County</td>
<td>22,700</td>
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</table>

The Toledo Metropolitan Statistical Area (MSA) consists of three counties: Fulton, Lucas and Wood counties. The total land area is 1,369 square miles with 618,400 people. The City of Toledo, centrally located in the MSA, accounts for 56 percent of the metropolitan population in the 84 square miles within the corporate limits. The Toledo MSA is the trading center for a larger Northwest Ohio trade area. This trade area consists of 14 counties with a population of 1,237,000 people.

Toledo has historically been a manufacturing community with strong ties to the glass and automobile industries, supplemented by large grain and transportation service industries. According to 1984 employment figures for the three-county area, manufacturing companies employed 22 percent of the work force. Of the 64,000 manufacturing workers, 79 percent were employed in the production of durable goods. Lucas County ranks 39th in the nation in total shipments in manufacturing, according to Sales and Marketing Management’s Survey of Industrial Buying Power. Toledo’s manufacturing is stabilized by the headquarters of eight major firms, six of which are listed in the top 500 corporations by Fortune Magazine.

A comparison of 1983 and 1984 annual unemployment rates for Lucas County shows a solid recovery in local employment. The 1984 annual average unemployment rate for Lucas County dropped to 9.3 from the 1983 annual average of 12.1. In 1984, total employment for Lucas, Wood and Fulton counties stood at 257,600, up 12,700 or 5.2 percent over 1983. Manufacturing employment was reported to be 64,800, up 8.7 percent over 1983, with transportation equipment showing the strongest growth. The 1984 annual average figure of 17,200 employed in the transportation equipment industry represented a 20 percent increase over the annual average in 1983.

The central midwest location and the surrounding rich agricultural land have made the Toledo area a natural transportation center for the movement of manufactured goods and grain. The Port of Toledo, which moved 20.1 million tons of cargo in 1984, is an international facility with a free trade zone and three large grain elevator operations. The recent expansion of its foreign trade zone makes it the largest free trade zone on the Great Lakes. The trucking and rail industries have been prominent in the community for several years.
Toledo's Major Business Headquarters

*Owens-Illinois, Incorporated ........................................ 4,000
*Libbey-Owens-Ford Company ......................................... 2,228
*Champion Spark Plug Company ....................................... 2,400
*Owens-Corning Fiberglas Corporation ............................ 1,950
*Dana Corporation ...................................................... 1,300
*Sheller-Globe Corporation ........................................... 240
The Andersons ......................................................... 950
AP Parts Company ...................................................... 600

*Fortune 500 company

Other Major Manufacturers and Utilities

Jeep Division AMC .................................................... 7,098
Hydra-matic Div. of General Motors Corporation .............. 4,700
Toledo Edison Company .............................................. 2,445
Chrysler Corporation ................................................. 1,350
Doehler-Jarvis/Farley Industries, Inc. .............................. 1,054
Teledyne CAE ......................................................... 900
Ohio Bell Telephone Company ....................................... 937
Ford Motor Company .................................................. 950
DeVilbiss Company .................................................... 800
General Mills, Incorporated ......................................... 750
Manville Building Materials Corp. ................................ 600
Schindler-Haughton Elevator Corporation ......................... 590

MAJOR AREA EDUCATION

Universities — MSA — Fall 1984 Enrollment
The University of Toledo ............................................. 21,039
Bowling Green State University ................................. 16,690
Medical College of Ohio at Toledo ............................ 772
Lourdes College ...................................................... 571

Two-Year Community & Technical Institutes
The University of Toledo Community ............................ 3,916
and Technical Institute
The Michael J. Owens State ....................................... 3,916
Technical College .................................................... 4,784
School Enrollment — Lucas County
Public, Elementary and Secondary ................................ 71,361
Parochial, Elementary and Secondary .......................... 12,168

TOLEDO'S TRANSPORTATION

Port of Toledo — 1984
Waterborne Commerce (net tons) 1
Coal ................................................................. 12,066,498
Grain ............................................................... 2,615,230
Overseas Cargo .................................................... 1,536,104
Total ............................................................... 20,194,030

Toledo Express Airport — 1984 2
Air Passengers .................................................... 575,649
Air Freight .......................................................... 3,368,430

Trucking 3
Trucking Firms ..................................................... 103
Local Cartage ...................................................... 22

Toledo Regional Transit Authority — 1984 3
TARTA Buses ....................................................... 228
TARTA Routes ..................................................... 38
TARTA Passengers ................................................ 15.2 million