

## MULTI-LEVEL INDUSTRIAL BUILDING: A POSSIBLE INCENTIVE FOR ADDITIONAL CENTRAL CITY EMPLOYMENT AND INDUSTRIAL DEVELOPMENT

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The exodus of industrial plants from the central city to modern one-floor facilities in suburbia and exurbia has become a chronic complaint -- and ailment -- of central cities across the country.

Results of this migration have posed nearly insoluble problems to central cities. The unemployment rate is steadily climbing, city population is declining, taxable incomes, properties and goods are decreasing and consequently there is a multitude of vacant old industrial buildings, adding to the slums and blighted conditions which are reflected in increased building deterioration, non-taxable land and a variety of safety hazards.

In an effort to minimize some of these problems, a study of the buildings in central Cleveland was completed recently by William A. Gould and Associates of Cleveland, architects and city planners, under a technical assistance grant from the Economic Development Administration of the U.S. Department of Commerce.

An earlier survey of the Cleveland industrial space market, completed in 1965 and also sponsored by the Department of Commerce, indicated what everyone had expected: The Central city contained a growing number of obsolete or near-obsolete buildings and limited amounts of land for new industrial development. Furthermore, the most available vacant industrial land was scattered, usually small in size and high in cost.

The survey showed more than 6,400,000 square feet in existing building space was vacant and only approximately 56,000,000 square feet or 1,300 acres of undeveloped industrial land (2.66% of the total land in the City) was available. Twenty-six percent of the total was unusable because of poor topography, access, limitations of small size and shape or the site was to be acquired for freeways.

Although industrial space rental rates in the suburbs were \$1.25 and up per square foot in 1968 as opposed to \$1 and under in the city, industries found the suburbs more accessible and offered room for expansion, adequate off-street parking, fewer traffic, vandalism and crime problems, a generally better business atmosphere.

Those occupying aging multi-story industrial space in the central city were smaller service and repair firms and industries which must be centrally located, such as warehousing and distribution. Generally, advantages in renovating the older structures were found to be minimal because of the high expense and difficulty to change to modern plant operations, though some warehousing and distributing companies have renovated buildings successfully for their unique needs.

From the 1965 survey, Gould and Associates felt that one alternative to alleviate the problem might be a new multi-level industrial building featuring the most advanced design and engineering characteristics for efficient production. The primary objective would be to demonstrate that multi-level operations at inner city locations were operatively feasible. Secondly, it might maintain a level of job opportunities necessary to contribute to a healthy central city.

Other primary objectives were to develop a high density industrial manufacturing and/or warehousing facility to permit intensive use of high cost urban industrial land which included:

- evaluating the planning, architectural and economic feasibility of a specific and real project through identification of a potential site
- programming, planning and development of appropriate standards
- conducting a survey of potential support from community users and leaders
- identifying existing construction and development costs and tenant rental rates
- examining unknown technical problems that would affect location, design and use of the building.

The secondary objectives were:

- to determine the extent in quality and quantity a multi-level industrial building would be a factor in retaining employment for inner city residents
- to investigate the influence of such a structure in retaining local industries which must relocate or improve their present facilities by determining advantages of location near an available labor supply in the central city

- to evaluate types of industries that could function within the building
- to select representative Cleveland-located industries which have a realistic need for such new facilities.

Approaching the feasibility evaluation as a community development process, it was essential to evaluate the community support.

There is a need for small and medium-sized industrial firms in Cleveland to operate successfully and with competitive flexibility. Though most leaders in the business community recognized the city's problems of industrial moves out of the city, the degree of importance that was identified varies from complete apathy to alarm

There was support for the multi-level industrial building from representative community leaders, but their financial support of an actual demonstration project hinged on its financial feasibility, the political support from City Hall and execution of an overall plan to improve

Cleveland's total urban environment to insure success. No one would risk individual commitment. Also important was the project's priority among community leaders and how it would be coordinated with related key improvement projects, such as safety, schools, sanitation, housing, and social issues. No priority of importance was really established. The support of local foundation executives failed because they did not identify the real significance of an industrial development base for the economy.

The five industries were selected to possibly use the building--food processing, apparel and related products, printing and publishing, fabricated metal products, and non-electrical machinery. Reasons for choosing these industries were that all have the need of traditional or operational proximity to each other to gain advantage of suppliers and their competition.

Three actual site areas were chosen for more detailed evaluation. (See figure 1) In these areas, the unemployment rate ranged from 7% in 1968 in the predominantly

## SITE STUDY AREAS

AND SELECTED NEIGHBORHOODS

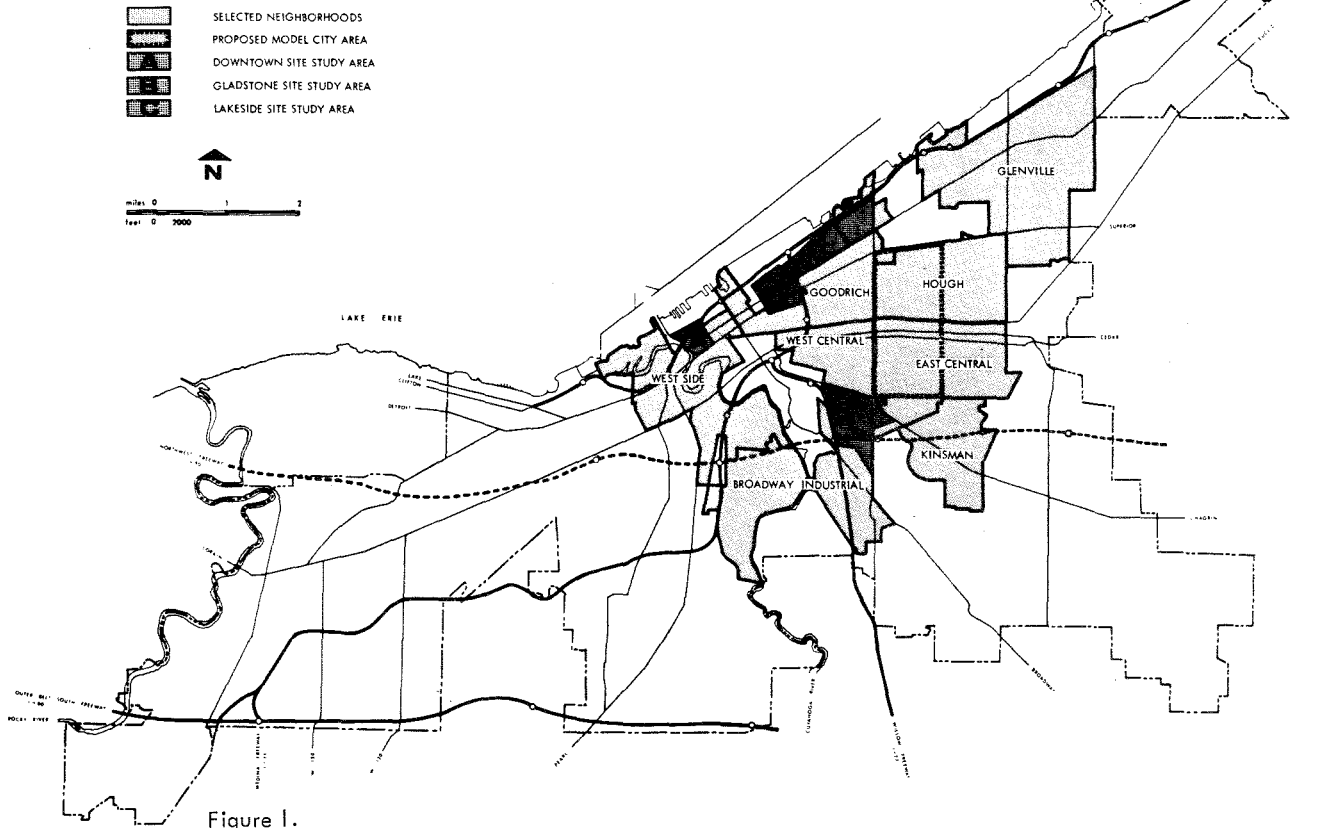


Figure 1.

white neighborhood to 21% in the predominantly black area. Though the total city population was steadily decreasing, gross employment was reducing at an even faster rate, mainly because fewer manufacturing jobs, significant income producers in the central city, were available. In part, this was due to technological and automation changes, but principally, the move-out by key employers from the city can be identified as the greatest contributor to this deplorable situation.

It was, and is, almost impossible for skilled and unskilled workers, especially those in the minority groups, to move to the suburbs where restrictive practices prohibited these residents. Furthermore, public transportation to outlying areas could not assist in this problem and private transportation was unattainable for many of the members of minority groups because of the costs. Likewise, car ownership is difficult for inner city families.

Key factors in selecting a final site were based on availability of land, cost of land and the opportunity to give impetus to existing urban renewal and Model Cities projects in close proximity, plus meeting the objectives of working - living relationships.

Also affecting the feasibility of this innovation were zoning, building code requirements, detailed soil and subsurface conditions, financing and operating requirements.

The food processing industry (prepared foods, snack foods, frozen products, meats, cold storage, produce storage, packaging) was the primary choice for the detailed feasibility study. A 16-acre site was selected in Cleveland's Gladstone Urban Renewal Area (See Figure 2), adjacent to the Model Cities designated planning program - a potential source of labor.

The site had been cleared and immediately available from one owner, the City. There was possible flexibility for expansion of the site and the cost of land was favorable.

In addition, mutually beneficial relations could be established between future tenants and the adjacent Northern Ohio Food Terminal which has been traditionally the city's food distribution center.

A group of potential tenants from the food industry was identified by William A. Gould and Associates and a marketing consultant surveyed the group to permit a more precise definition of tenant needs.

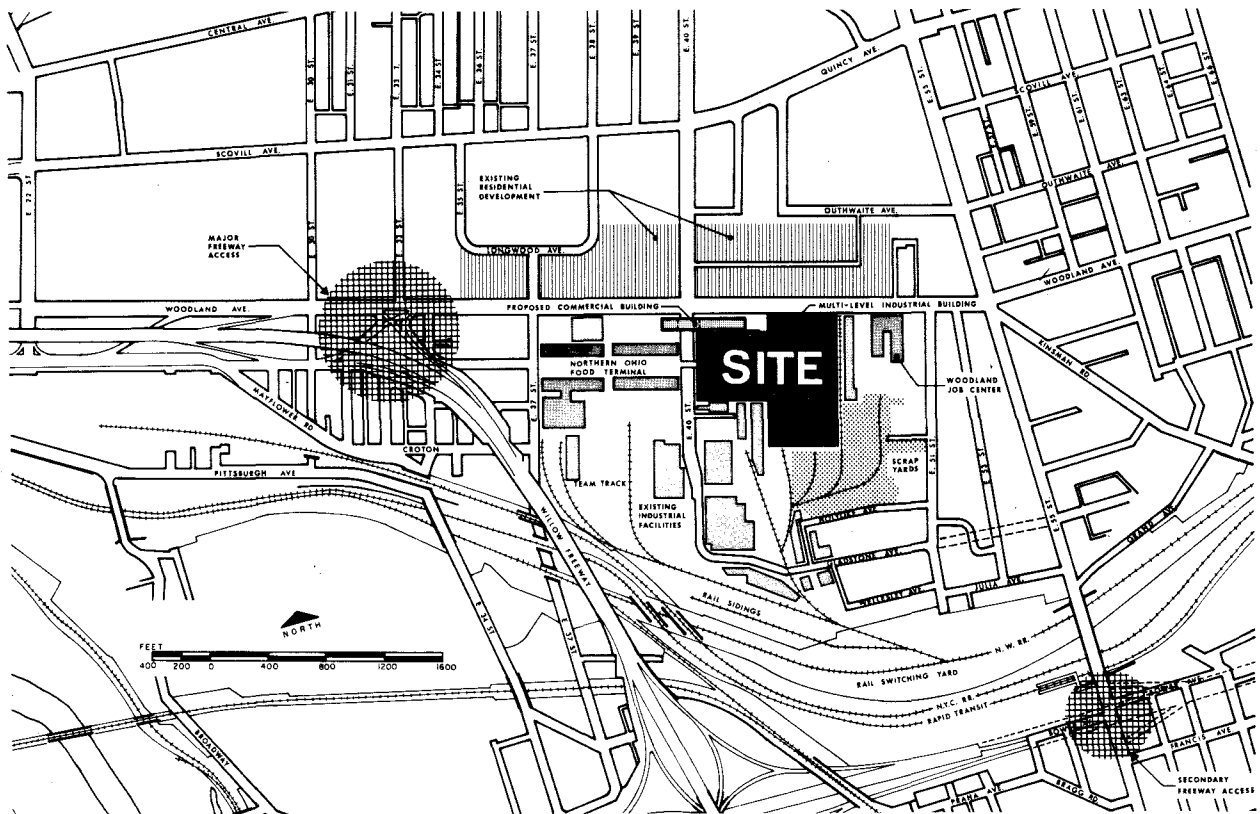


Figure 2.

Gould and Associates then designed, priced and test-marketed three prototype multi-level industrial buildings, attempting with each design to determine a facility which would serve the tenants' operational and financial needs. Each prototype evaluation included parking, truck holding and docking facilities, warehousing, processing and support services.

#### Prototype Building One

Prototype Building One (see Figure 3) was a 13-floor structure, a radical departure from recently-built one-floor facilities in the industry. Upper levels would support a "processing tower" while lower floors would provide space for truck docking, warehousing and employee/customer car parking. The design called for all tenant firms to utilize common materials - handling facilities -- freight elevators -- thus creating a central management scheduling program that was thought to be a problem by those not visionary enough to recognize the potentials.

Street entrances led into a central core from which passenger elevators and stairways gave access to all levels. Space for warehousing or processing, truck docking and maneuvering areas was located in the sub-grade level. Levels one and two also had space for warehousing or processing activities, plus truck circulation and docking areas. Rail sidings with docks were located at level one.

The entire concept of "living on top of each other" was contrary to tenants' business instincts, as they visualized it. A totally-shared materials-handling system, as indicated in the market study, was out of the question to the conservative operators. Why risk the unknown if they could continue to do business as they had for years?

Furthermore, an evaluation of Prototype Building One showed there was no need for tenant space among the larger food processors, such as Kroger's and/or Stouffer's, for new space in the central city, since all either moved or were committed to move to suburban sites at the time of this evaluation.

However, a potential new, but smaller, tenant market within the industry was identified -- jobbers, purveyors, commission merchants and processor-wholesalers of foods. Though their functional space requirements were not met in Prototype One, they indicated an interest in this project.

The financial feasibility of Prototype One was based on total private financing and return on investment based on speculative building requirements.

Total cost was \$26,449,300.00 which required an annual cash income of \$8.37 per square foot of rental space, as compared to the 1968 rental market in the Greater Cleve-

land area which was \$1.25 to \$1.75 per square foot for new suburban space and \$.65 to \$1.00 in older existing buildings in the central city.

#### Prototype Building Two

Designed as a three-level facility (see Figure 4), Prototype Two provided space for processing and warehouse use adjacent to the truck service with parking on the roof for 470 cars. Space for warehousing or processing, truck docking and maneuvering areas was located on all three levels.

Each tenant would have private loading docks at each floor, controlling his own material handling. A total of 184 docks and 26 holding spaces would be allocated in proportion to the amount of space rented. An internal ramp system for forklift trucks was provided for materials movement between train docks and users on all building levels.

Total cost of Prototype Two was \$16,489,760.00, which required an annual cash income of \$5.99 per square foot, compared to \$1.25 to \$1.75 per square foot for new suburban facilities and \$.65 to \$1.00 in older buildings in the central city.

Though Prototype Two presented a functionally workable solution for smaller tenant needs, it did not appreciably increase building efficiency despite the elimination of freight elevators and common services. The primary reason for this poor efficiency was the required provision for truck maneuvering space and docks on multi-level structure adjacent to the tenant's processing space.

In addition, the intensity of use would not appreciably enhance the employment picture for the central city, not attaining the public interest objective of maintaining jobs.

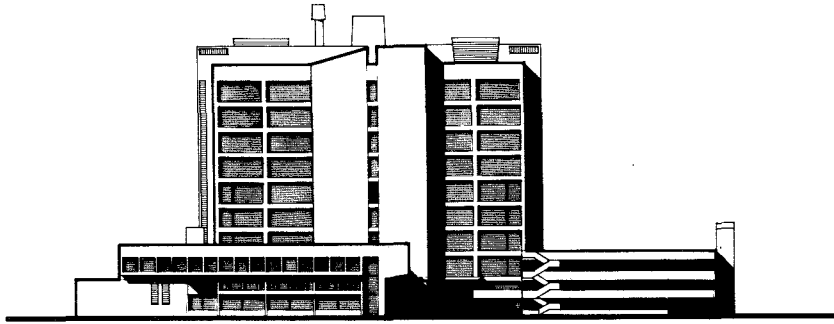
It also became apparent that initially a combination or joint venture of government assistance subsidy as well as private financing was necessary to make a multi-level building economically possible in Cleveland as a demonstration. The community and the federal governments were not ready for such an experiment.

#### Prototype Building Three

The five-level Prototype Building Three (see Figures 5 and 6) featured truck holding and auto parking in separate structures, allowing these facilities to be used by the Northern Ohio Food Terminal in addition to building tenants, thus giving double use to the materials-handling subsidized central facility.

This approach also permitted investigation of financing and development of separate building units by use, thus lowering the rental rate for the individual space. Since Federal EDA funds were known to be available, it was

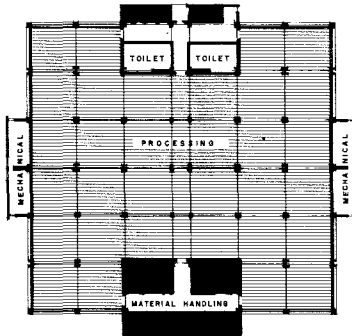
# PROTOTYPE ONE



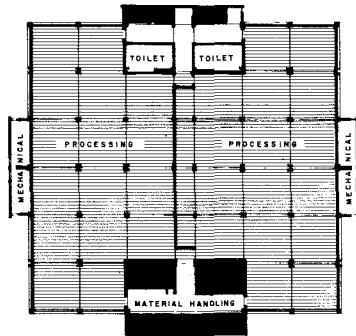
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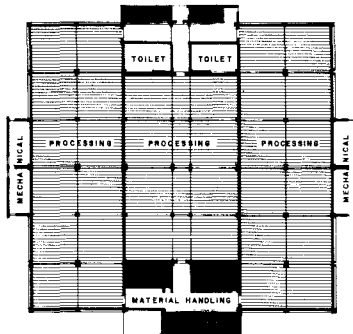


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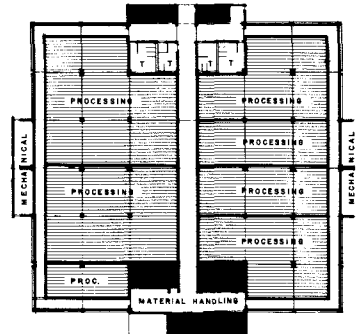


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Figure 3.

# PROTOTYPE TWO

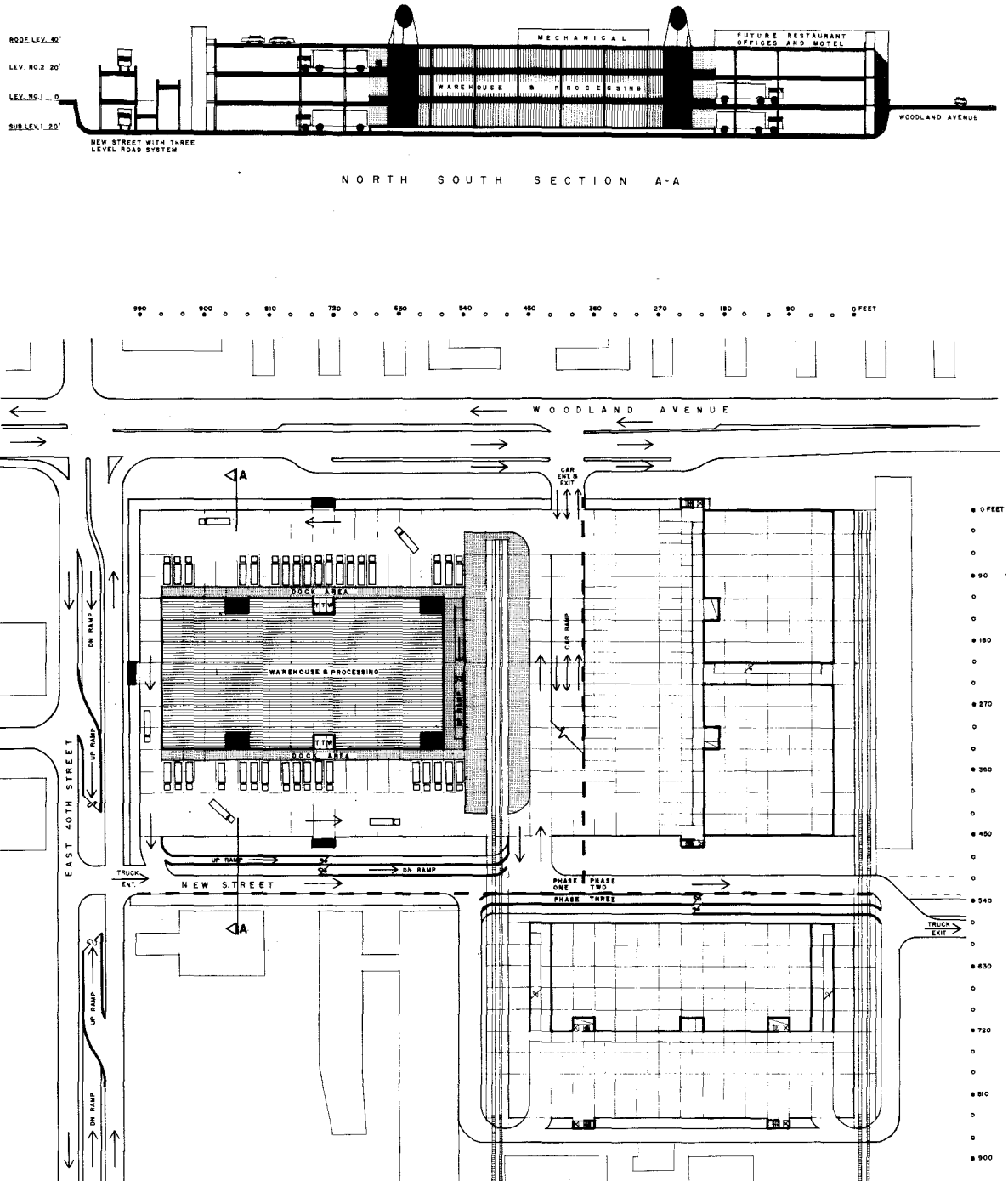


Figure 4.

# PROTOTYPE THREE

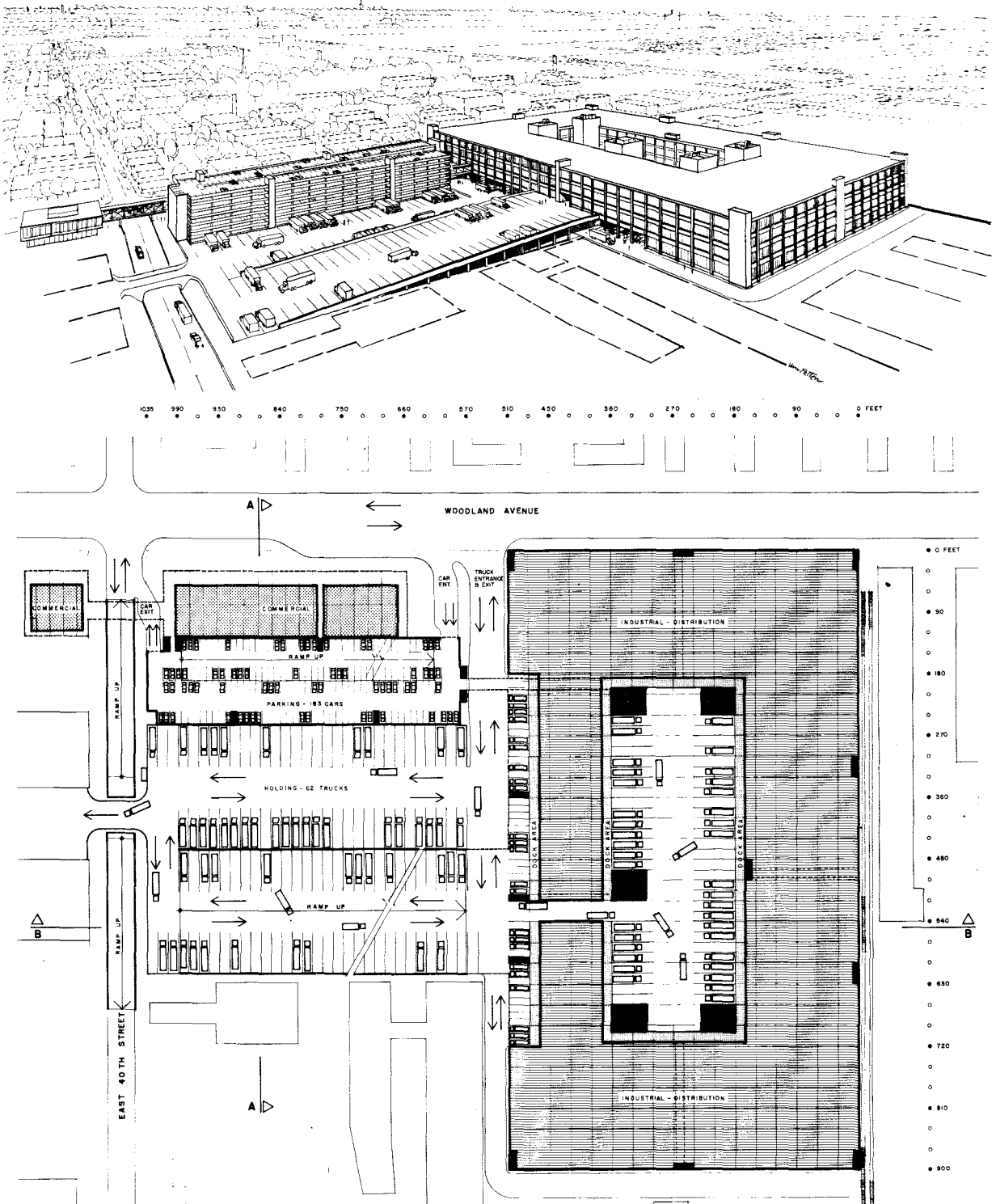


Figure 5.

# PROTOTYPE THREE

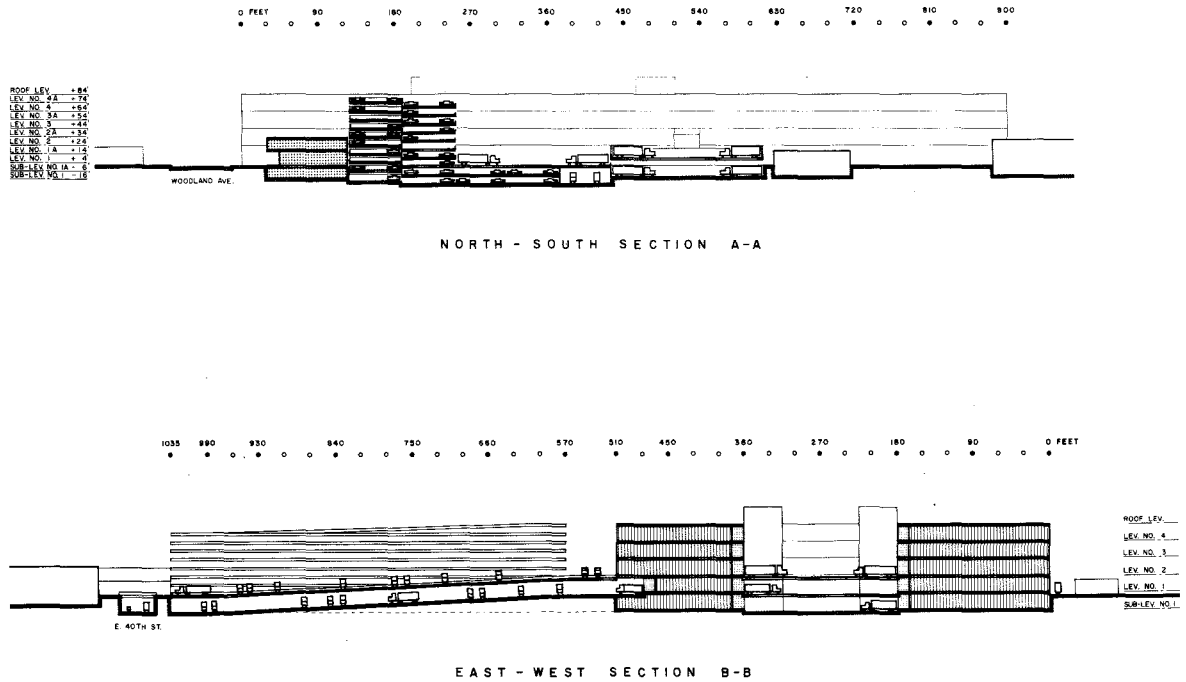


Figure 6.

decided they should be allocated to specific sections of the building, dependent on use and public good.

The major functions were housed in four separate but interconnected facilities: an off-street parking garage, a truck holding area, an industrial building and a central building service core.

Construction of the parking garage could be financed by the City using revenue bonds or general obligation bonds. Financing for the holding area and central building service core would come from a direct EDA grant to the City. The industrial building would be financed by an EDA loan covering 90% of the construction costs with the 10% equity coming from local non-profit sources. A tenants' association would be responsible for operating and maintenance costs of the central building core.

The parking garage would have a 2,188-car capacity in 10 levels -- two below grade and eight above. The holding capacity figure was based on the estimated number of employees in the industrial building plus the needs of the food terminal for additional parking. The

garage would also serve the proposed supporting commercial facility within the building complex. There would be a pedestrian bridge link to the industrial building. The commercial support building would also be directly connected to the garage. The latter building would contain a bank, shops, etc.

The 186-vehicle truck holding area would consist of three tiers or levels -- one at grade, one ramping down to sub-level and the third ramping up to level two.

Service trucks, entering from the main thoroughfare, via an access road, would move either directly to the food terminal by traveling through the holding areas at grade, to a designated holding space or to a dock in the central building service core.

Access would also be available from the truck holding area to individual docks on all three levels with an on-site central electronically-controlled station near the truck entrance beamed to each holding and dock area for proper scheduling.



With a more broadly identified potential tenant market, the building had to be flexible enough for each tenant to achieve his individual operational objectives. Prototype Building Three provides a basic shell space for industries to make their own leasehold improvements. It was also concluded that this building could be adapted for diversification of industrial types other than food.

The central building service core would contain freight and passenger elevators plus mechanical (air conditioning) and electrical utility risers for all five levels -- one sub-level and four above. Industrial space would be constructed around the service core and would total 1,745,900 square feet of rentable space. Cold storage and general warehousing were planned for the sub-level area.

Total cost for the industrial building was \$27,220,000 which required an annual cash requirement of \$1.82 per square foot, as opposed to the \$1.25 to \$1.75 per square foot for new buildings in the suburbs and \$1.00 and under for older structures in the central city. Costs for the building service core, the holding area and parking garage were not included, since they were to be financed by grants or to be self-sustaining.

It was assumed that tenants located on level one would need flexible scheduling and direct access to truck docks because of handling bulky goods or frequent deliveries and shipments. For these tenants with extremely high service requirements, docks for small trucks at grade along the outer western side of the building were planned in addition to those in the core of the building.

Truck docks on level two would be for the common use of tenants on levels two, three, and four. But levels three and four would be for distributors or manufacturers of small low weight bulk products. Scheduling would be handled by a central management service.

It would be possible for a rail spur track to be located along the eastern side of the building with dock space for up to 18 railroad cars. However, due to the nature of the building's use, the docks were not provided as part of the basic building costs.

A new concept of subsidized industry must be identified at the federal level, just as agricultural subsidies have been accepted since the 1930's.

Prototype Three could be implemented if a group of private firms have a primary location requirement in common or see a possible social need to justify participation as tenants in such a building. They would have to furnish the necessary equity in a non-profit tenant corporation and have the ability to accept from \$2 to

\$2.50 per square foot in rental rates -- high for general manufacturing space.

An alternate idea would be for the city or federal government to recognize the ultimate need of retaining an industrial group in the central city because of its contribution to the city's economy through taxes, employment and a stimulation of the city's economy. This progress would also involve a non-profit tenant group, but the equity capital could come from other local sources, such as a non-profit foundation, of which there are many. A visionary dream, with federal support, could be a reality to save our cities.

The project did reveal that Prototype Three would yield \$1,000,000 more taxes than a single - level facility, both being figured with the same number of employees per square foot and based on 40% site coverage for the single - level facility. The prototype would provide job opportunities for an estimated 3,490 persons while the single - level building would accommodate only an estimated 590 employees.

### Conclusions

The obvious greater cost of a multi-level industrial building limits its use for specific urban situations, since the demand for industrial space in the metropolitan area can be met at lower cost in buildings in the suburbs. At least, this is true in Cleveland.

This idea can become a possibility when and if innovative structural, material handling and building systems are developed to the point of effective economical operations at a cost competitive to single-level building cost and operation. It can also become a reality when local or federal governments subsidize or develop the project as a social benefit for retaining employment opportunities, slum and blight removal, or to revitalize an industrial area or maintain the declining tax base.

Key factors which make multi-level industrial building more costly include the need for structural floors with heavy load-bearing capacity; the provision for services on structure, such as truck docking; warehousing and auto parking; the need for complex building service systems, such as elevators, stairs, mechanical and electrical requirements due to the need to run materials and people horizontally and vertically; unique safety and building code standards requiring fireproofing, sprinklers, emergency stairs, exits and separate ventilation systems.

Best suited for multi-level tenancy are light manufacturing operations with minimum to moderate material handling requirements, preferably low bulk goods and moderate truck delivery requirements that can be scheduled for dock usage.

None of the three prototypes cost at levels of investment competitive with one-floor construction. But it should be emphasized that higher than average construction costs, the availability of suburban sites and the soft market for space in old buildings were all variable factors in Cleveland in 1968, which in other cities could have been more favorable to this type of project.

Assuming subsidies from both the city and federal governments are available, the break-even rental rate for the third prototype design was \$1.82 per square foot at 100% occupancy for a building of 3 million gross square feet and this 1.8 million square feet of rental space is a possibility. However, the concept of federal subsidy has to be made viable in Washington.

Specifically, subsidies would include a 90% EDA loan for the industrial space, city revenue bond construction of the parking garage and an EDA grant to finance the holding area and the central building service area.

The \$1.82 per square foot figure is about 25% greater than suburban one-story building rates and as much as \$1.25 greater than rates for space in old multi-story buildings in the central city.

However, it should be pointed out that the result of any such analysis is dependent on the particular industry analyzed. Obviously, food processing presents special problems in handling because of high bulk and weight in relation to value. Odor, waste disposal and spoilage also are problems related to the food industry.

A building designed for light loads and a simpler material handling system would rent at approximately 20-25% less. However, it might still be too costly for Cleveland.

And until land in suburban areas becomes scarce and consequently more expensive, it is likely that a multi-level industrial building will not be economically feasible in central Cleveland in the private building market.

In the meantime, socio-economic problems in the city caused by industries moving out continues with fewer employment opportunities, declining population, old buildings and minimal vacant industrial land and must be fought by the city, operating on a limited income that must also support and expand vital services, school programs and redevelopment projects oriented primarily to housing for its citizens. Industrial attention has not become a top priority in the city political life.

From this research, Gould and Associates recommends that the city develop an on-going aggressive industrial redevelopment program, having as its goals to maintain

and increase the city's tax base, retain and boost employment opportunities for its residents, to improve the general environment of central city neighborhoods, keep and add to the city's industrial base of small and medium size firms, provide initial space for new Negro-owned businesses, to sustain certain marginal businesses because of their unique and necessary services and last, but not least, attract new business to the central city (principally high employers).

To attain these goals, it is readily apparent large amounts of money and time must be committed by both the city and federal governments to this program. The question is: Are they ready?

This redevelopment program should include:

- General planning to give the city the most efficient use of industrial land by providing both single level and multi-level building sites.
- A plan for replacement of obsolete buildings and relocation of firms now operating in them.
- Provision for land assembly for new sites.
- Provision of off-site improvements, truck holding areas, utilities, auto parking facilities and other amenities to attract new industry.
- Provision of police and fire protection and other city services.

The fact that privately financed and built multi-level facilities exist in New York City, Chicago and in Europe illustrates that such development is economically feasible under certain conditions.