

# Use of Official Map Procedure to Reserve Land for Future Highways

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The use of the official map procedure, by which precise designation of right-of-way lines and site boundaries of streets and highways may be established in advance of actual taking and construction, thereby preventing extensive and costly development within these lines, is discussed. Enabling legislation in Wisconsin is described together with methods developed for its implementation, as well as the advantages to be gained therefrom. A unique surveying and mapping technique involving a simple and economical system of survey control, particularly adapted to the special needs of official mapping, is presented and its advantages for planning and engineering work described.

•IN A SERIES of broad-range transportation studies now under way in some of the largest metropolitan regions of the United States, including Chicago, Philadelphia, Los Angeles, Pittsburgh and Seattle, an entirely new approach to the transportation problem has been developed. These studies all recognize that the older, piecemeal planning efforts provide no lasting solutions to the transportation problem and that a new approach, based on comprehensive planning principles, is necessary if all elements of the transportation problem are to be considered and a lasting solution found. Consequently, a great deal of stress is being placed, at the present time, on the importance of formulating long-range highway system plans at all levels of government. It must also be recognized, however, that any adequate solution to the transportation problem will depend not only on sound plan formulation at all levels of government but also on practical plan implementation as well.

An interval must necessarily exist between the time a given transportation facility is incorporated into a comprehensive plan and the time of actual construction. This time lag is inherent in the planning process and it is during this time lag that means must be found to reserve land most effectively for the project and assure the integrity of the long-range system plan.

Although urban planners have developed a full range of plan implementation devices to effect such land reservation, few, if any, of these devices appear to have been adapted and applied directly by highway agencies. The official map is one such implementation device at the disposal of the urban planner which is readily adaptable to highway needs and which can have widespread usefulness in highway plan implementation.

## OFFICIAL MAP CONCEPT IN URBAN PLANNING

Before discussing the official map as it might be adapted to highway purposes, a brief description of this device as traditionally conceived and employed in urban planning administration is in order.

The Wisconsin official map act, as set forth in Section 62.23 (6) of the Wisconsin Statutes, is typical of good State legislation enabling official mapping for urban planning

purposes. This act provides that the governing body of any city may establish an official map for precise designation of right-of-way lines and site boundaries of streets and public lands. The map is given the full force of law and deemed to be final and conclusive as to the location and width of both existing and proposed streets, highways, and parkways.

The primary function of the official map, as conceived for city planning purposes, is to implement the community's arterial street and highway system plan. It does this by protecting the beds of future streets and highways, as well as the beds of existing streets and highways that are to be widened, by essentially prohibiting the construction of new buildings in such beds. The police power device used to enforce the official map is the building permit. A landowner desiring to construct a building in the bed of a mapped street or highway may be denied a permit where the owner will not be substantially damaged by placing his building outside the mapped right-of-way lines. The landowner may, if denied a permit, apply for a variance and, if he can prove that his land is not yielding a fair return, may be granted a permit by a quasi-judicial board of appeals for a building that will increase as little as possible the future cost of opening or widening the street or highway.

A secondary function of the official map in some States, including Wisconsin, is to implement the community's master plan of parks and open spaces. In this respect, the official map can be used to reserve, for current or future use, land for parks and drainageways. Reservation of land for the latter can have important implications for the highway engineer.

The official map thus allows a municipality to express its intent to reserve land for public purposes without commitment to immediate acquisition, and insures that land needed for future streets and highways will be available at the price of unimproved land. The possible monetary savings that can accrue to the community from the proper application of official mapping are, therefore, considerable. For example, a typical recent highway construction project in the Milwaukee Metropolitan Area involved the reconstruction of six route miles of State trunk highway to expressway standards on new location through a rapidly urbanizing area. Right-of-way costs were 19.8 percent of the total construction cost of \$7,170,000 and involved the acquisition and razing of several recently completed commercial and light industrial buildings.

The fact that the official map can insure the integrity of the community's arterial street and highway system plan is, however, even more important, and the official map can serve as a refinement of the long-range highway plan, reflecting certain aspects in a precise, accurate, and legally binding manner. By exercise of the police power, specific proposals contained in the long-range plan can be assured of implementation and street and highway reservations can be based not only on immediate needs, as must be the case when such areas are acquired by exercise of the power of eminent domain, but also on long-term future needs.

A concomitant and equally important benefit accruing to the community through properly executed official mapping is that such mapping adequately locates and records all existing street lines and thereby tends to stabilize the location of real property boundaries, both public and private. As an accurate existing condition base map, the official map greatly expedites planning and engineering work of all kinds.

Although other plan implementation devices, such as building setback requirements in zoning ordinances, special building setback ordinances per se along major streets, building setback lines on recorded subdivision plats and private deed restrictions, can all be used to reserve land for future widening of existing streets, none of these devices can be applied to proposed streets and highways. Subdivision control ordinances can be used to protect future streets and highways, but can do so only indirectly, and cannot be used to prevent the erection of buildings in the beds of future streets when the erection of such buildings takes place without land subdivision. The official map is the only arterial street and highway system plan implementation device that operates on an areawide basis in advance of land development and can thereby effectively assure the integrated development of the street and highway system.



## EFFECTIVENESS OF OFFICIAL MAP

The official map is one of the oldest plan implementation devices at the disposal of the urban planner. It is also one of the most effective and efficient devices that can be brought to bear on the problem of reserving land for future public use. A study and evaluation of local highway system planning recently conducted in Wisconsin<sup>1</sup> bears this out.

The study procedure included structured interviews directed toward an analysis of the local highway planning process and these interviews included a group of questions directed at determining the relative effectiveness of existing arterial street and highway plan implementation devices. Interviewees included professional planners; professional city, traffic, and highway engineers; mayors; city managers; aldermen; large-scale land developers; and citizen leaders, including newspaper editors. Each of the interviewees was asked on the basis of his personal experience to rate as effective, moderately effective, or ineffective each implementation device he had actually observed in operation. Results were tabulated and through the simple device of assigning numerical values to each rating, weighted averages were obtained for each device reflecting combined opinion.

Results of the rating are given in Table 1. Two of the most commonly employed plan implementation devices (zoning and capital budgeting) were consistently given extremely low rank orders of effectiveness, whereas two less frequently used devices (urban renewal and official mapping) were consistently given the highest rank orders.

The high order of effectiveness attributed to the official map as a plan implementation device is particularly significant to this paper. The interviewees attributed the effectiveness of the official map to the following characteristics of the device:

1. Unlike subdivision control which operates on a plat-by-plat basis, the official map can operate over a wide planning area well in advance of requests for development.
2. The proper application of the official map necessitates the preparation of precise or definitive plans beyond the general plan stage and thereby assures that the broad objectives expressed in the highway plan are reduced to specific and attainable ones.
3. The official map is a useful device to achieve public acceptance, if not understanding and support, of a highway plan, in that it serves legal notice of the government's intentions on all parties concerned well in advance of any actual improvements. It thereby avoids the altogether too common situation of development being undertaken by segments of the public without knowledge or regard for the long-range plan and thereby does much to avoid local resistance when plan implementation becomes imminent.

The same study found that although the public (i. e., the electorate) may accept and support the general concept of a long-range plan there is generally no awareness among the public of the plan proposals or their implications as these may affect specific areas. Consequently when plan implementation, in the form of a street and highway improvement, becomes imminent, a great deal of local resistance is generated not to the plan in general but to a specific portion of it. The strong local reaction is often successful in blocking the plan implementation and thereby destroying the integrity of the over-all system plan. Planning tools that can mitigate such local resistance are therefore quite valuable to attaining integrated arterial street and highway systems.

It further appeared that certain plan implementation devices are growing in effectiveness because of newly developing techniques and because of an awakening by important segments of the public to the needs and benefits attending these devices, whereas others are declining in effectiveness at least insofar as implementation of local arterial street and highway plans are concerned. The official map and subdivision control fall in the former category, and bond issues (which, in direct contrast to earlier practice, are being increasingly directed toward schools and sanitation and away from streets and highways) in the latter category. Evidence of the growing awareness of the importance

<sup>1</sup>K. W. Bauer, "A Study and Evaluation of Local Highway System Planning in Wisconsin," U. S. Bureau of Public Roads and State Highway Commission of Wisconsin (May 1962).

TABLE 1  
SUMMARY OF INTERVIEW RESULTS ON RELATIVE EFFECTIVENESS OF PLAN IMPLEMENTATION DEVICES, MARCH 1961

Plan Implementation Device	Rating by Technicians				Rating by Lay Leaders				Over-All Combined Rating <sup>a</sup>	Over-All Combined Rating <sup>a</sup> by City					
	No. of Times Rated			Com- bined Rating <sup>a</sup>	No. of Times Rated			Com- bined Rating <sup>a</sup>		Madison	Racine	Wauke- sha	Apple- ton	Green Bay	Janes- ville
	Very Effective	Moder- ately Effec- tive	Ineffec- tively		Very Effective	Moder- ately Effec- tive	Ineffec- tively								
Urban renewal	5	0	0	4.00	1	1	0	2.50	3.57	3.60	3.50	--	--	--	--
Official map	11	1	0	3.92	9	4	0	2.69	3.28	3.17	--	3.29	3.40	3.29	--
Bond issues for specific improvements	8	2	1	3.45	10	0	0	3.00	3.24	3.57	2.80	--	3.33	3.00	--
Subdivision control	15	4	0	3.79	17	6	0	2.74	3.21	3.29	3.29	3.25	3.00	3.14	3.29
Precise plans	5	2	1	3.25	3	4	2	2.11	2.65	2.29	--	--	--	2.50	3.17
Advance right-of-way acquisition	7	0	3	2.80	8	1	2	2.44	2.63	3.00	--	2.75	--	1.75	--
Zoning	2	15	3	2.65	11	9	2	2.41	2.52	2.43	2.83	3.00	2.43	1.57	2.86
Capital budgeting	7	7	6	2.45	3	12	6	1.86	2.15	2.57	2.29	1.88	1.86	1.57	3.00
Setback base line ordinances	3	6	0	1.67	7	4	0	2.64	2.03	2.86	--	3.12	--	2.80	--

<sup>a</sup>Weighted average by following assigned weights:

	Technicians	Lay Leaders
Very effective	4	3
Moderately effective	3	2
Ineffective	0	1



and effectiveness of official mapping in Wisconsin is indicated by the fact that the two largest cities in the State are currently undertaking the preparation of an official map, and the fact that approximately 60 percent of all the cities in Wisconsin having a population in excess of 25,000 have either adopted official maps or are preparing such maps.

### OFFICIAL MAP CONCEPT APPLIED TO HIGHWAY PLANNING

It is apparent that official mapping can be adapted to highway system plan implementation at the State level in two ways: (a) indirectly through cooperative State-local application of local official map powers, or (b) directly by a delegation of some form of official map power to the State highway agency.

#### Joint State-Local Efforts

In States where enabling legislation empowers local units of government to prepare and adopt official maps, this power can be indirectly applied to State and regional planning needs through cooperative State-local planning programs. Such cooperative programs must be founded on practical and workable local arterial street and highway system plans, plans that meet State and regional, as well as local, transportation needs and that can therefore be cooperatively prepared and adopted and jointly implemented by the various levels and agencies of government concerned.

In Wisconsin, local official map powers can have a widespread applicability to State highway facilities because the statutes provide that a local official map may be extended to include areas beyond the corporate limit lines but within the extraterritorial plat approval jurisdiction of the municipality. In Wisconsin, such extraterritorial jurisdiction includes the unincorporated area within 3 miles of the corporate limits of a first, second, or third class city, and within 1½ miles of a fourth class city or village. (In Wisconsin cities are classified for statutory purposes as follows: first class, Milwaukee; second class, 39,000 to 150,000; third class, 10,000 to 39,000; and fourth class, under 10,000.) Moreover, in Wisconsin the official map act is a part of the basic planning enabling act and as such is made applicable to towns as well as cities and villages.

Such joint State-local application of the official map power has actually been carried out in Wisconsin and specific examples can be cited. The State highway commission in 1961 prepared a definitive plan for the ultimate development of US 41 in the vicinity of the City of Oshkosh. Presently, this facility consists of a single roadway on a 175-ft right-of-way with partial control of access. The ultimate development plan seeks to preserve the capacity and life of this facility on its existing location by eventual staged conversion to a full freeway.

Additional right-of-way required for the staged construction of a second roadway, frontage roads, and interchanges was indicated on the long-range plan. Under then existing legislation, however, this plan had no force of law to assure compliance of private development with its objectives. The State highway commission therefore requested the City of Oshkosh to place approximately 9 route miles of the facility on its official map. This was done by two separate actions: (a) on March 7, 1962, incorporating 6 route miles of the facility (Wis. 26 to Lake Butte des Morts); and (b) on October 17, 1962, incorporating the remaining three route miles (Lake Butte des Morts to US 95). The entire 9 miles are outside of the corporate limits of the city, but within the city's extraterritorial plat approval jurisdiction. Thus these cooperative actions by the city and State preserve the integrity of the State's long-range plan and assure that right-of-way can be acquired either at no cost to the State through dedication if land subdivision occurs before conversion, or at minimum cost to the State as unimproved land, should conversion precede platting.

The City of Neenah has also similarly incorporated those portions of this facility lying within its extraterritorial jurisdiction (Cty. G to Cty. PP) in its official map, the action being taken on September 21, 1962, thereby fully protecting another 6½ route miles of this facility. Within the corporate limits of the City of Green Bay, this same facility was to be eventually reconstructed on entirely new location, and the city, on January 19, 1960, placed 1.44 miles of this new route (Highland Avenue to Larsen Road)

on its official map. In all, 16.94 miles of this major highway has been protected by cooperative official mapping to date.

The monetary benefits that can accrue to both the State and local governments through such joint exercise of plan implementation powers are considerable, but the pattern and direction that such plan implementation can give to private investment, by properly relating it to the facility, are of even greater importance.

### State Official Map Powers

Enabling legislation permitting State highway agencies to exercise official mapping powers would appear desirable as a supplement to local powers, or, in States where no such local powers exist, as a direct State level highway plan implementation device. Such legislation could empower the State highway agency either with full official map powers identical to those typically given local units of government or with modified powers.

In 1961, the Wisconsin Legislature amended the basic statute under which the State Highway Commission functions by creating Section 84.295, "Freeways and Expressways." This newly created statute, among other things, gives modified official map powers directly to the State highway commission, with the specific legislative intent to "protect from imminent and future costly economic development, corridors of lands to be available when needed for future highway construction."

The act provides that the State highway commission may, after a public hearing, establish corridors for freeways and expressways by surveying and mapping such corridors and showing the location and widths of rights-of-way required, including that for interchanges, grade separations, frontage roads, and the required alteration or relocation of existing streets and highways. The map must also show the location of property lines and record owners of land required. The completed map is placed on file with the county register of deeds. This action is advertised, and the property owners of record on the filing date are notified of this action by registered mail. The map may be changed from time to time by the same procedure.

The act in essence, prohibits the construction of any new buildings or structures, or the alteration of any existing structures within the officially mapped right-of-way, or "in such proximity thereto as to result in substantial damages when the right-of-way is acquired," without first giving 60 days' notice to the State highway commission by registered mail. The highway commission may then encourage alteration in such construction proposals to clear the needed right-of-way or may purchase the required right-of-way to prevent erection of any improvements thereon. No damages are allowed for any construction, alterations, or additions to buildings made in violation of the act.

Although considerably weaker than the local official map powers, this limited mapping power, if exercised within the framework of a documented long-range State-wide highway system plan, can nevertheless result in substantial benefits to the State. Moreover, the exercise of such mapping powers will permit sound decisions to be made on land use and development alternatives by private investors. The lack of any sound basis for such decisions in the past has been a constant source of friction between the State highway agency, local governments, and private developers.

### **SURVEY REQUIREMENTS**

Documented State-wide long-range highway system plans are usually presented by imprecise maps setting forth the general location of the major traffic corridors and, in general terms, the type of facility required to meet the ultimate traffic demands of these broad corridors. An official map, however, to reflect and refine certain aspects of such general plans properly, must be capable of precise and accurate interpretation. This requirement for precision and accuracy seems to provide the principal difficulty in the proper application of this plan implementation device at both the State and local level. Surveying and mapping techniques are now available which can readily overcome this difficulty without resorting to expensive centerline location surveys.



If adequate base maps of sufficient precision exist, and if these maps are based on permanently monumented field surveys so that their accuracy can be ascertained, then an official map can be readily created by simple compilation techniques. If, however, as is more often the case, adequate base maps are lacking, then an official mapping program will first require the construction of such maps.

Any accurate mapping project requires the establishment of a system of horizontal control, which consists of a framework of points whose horizontal positions and inter-relationships have been accurately established by field surveys. The map details are adjusted to these points and may be checked against them. For effective official mapping the horizontal control network must meet two basic criteria. First, it must be permanently monumented on the ground so that ownership and reservation lines shown on the map may be accurately re-established in the field when a planned facility reaches the construction stage. Secondly, the control net must permit the accurate correlation of property boundary line information with topographic data. Most photogrammetrically compiled topographic maps, whether produced for highway engineering or municipal engineering purposes, do not meet these criteria today.

At the present time, much new topographic mapping for city and highway engineering purposes is based on third order control nets having, at best, temporarily monumented stations. These control nets are tied to the National geodetic datum and the finished maps compiled on a State plane coordinate grid. Property boundary line maps, on the other hand, are most often mere compilations of paper records, with no real framework of survey control being used in their construction at all. Accurate correlation of such cadastral maps with topographic maps and even with other cadastral maps is therefore virtually impossible.

A system of horizontal control based on both the U. S. public land survey system and the National geodetic datum is therefore proposed as a practical basis for the compilation of official maps for both highway and city planning purposes. The establishment of such a control system requires the relocation and monumentation of all section and quarter-section corners within the area or corridor to be mapped, and the use of these corners as stations in a second order traverse net tied to the National geodetic datum. This order of accuracy is essential, even though it may not be required for the mapping work itself, so that the control net have permanent utility in all subsequent local survey work. The control traverse net thus establishes the exact lengths and bearings of all quarter section lines, as well as the geographic positions, in the form of State plane coordinates, of the public land survey corners themselves. Such a system of control has the following important advantages for official map purposes:

1. It permits the ready compilation of real property boundary line base maps to standards of precision and accuracy sufficient for official mapping with an absolute minimum of field survey work. Because the boundaries of the original government land subdivision form the basis for all subsequent property divisions and boundaries, the accurate re-establishment of the quarter-section lines and corners permits the compilation of property boundary line maps as well as the compilation by the usual photogrammetric methods of topographic maps.
2. It provides a common system of control for both topographic and boundary line maps. By relocating the public land survey corners and accurately placing them on the State plane coordinate system, it becomes at once possible to prevent the future loss of these corners and to correlate property boundary line information accurately with topographic details supplied by aerial mapping. This placing of property boundary and topographic data on a common datum is essential to sound official mapping, yet such a common datum is rarely used in engineering surveys today.
3. It provides an extremely practical control network readily usable by both private and public surveyors and engineers for all subsequent survey work within the mapped area or corridor, and thereby correlates and coordinates all survey work within the area or corridor.
4. For the first time, it makes the State plane coordinate system available on a practical basis for property boundary survey control, thus preparing the way for the use of State plane coordinates in boundary, easement, and right-of-way descriptions.

**CITY OF OAK CREEK**

**RECORD OF CONTROL SURVEY STATION - SECTION OR 1/4 SECTION CORNERS**

SECTION OR 1/4 SECTION CORNER  $\frac{24}{25} | \frac{24}{25}$  , TOWNSHIP 5 N, RANGE 22 E

OR BENCH MARK NO. \_\_\_\_\_ IN \_\_\_\_\_ 1/4 SEC \_\_\_\_\_, T 5 N, R 22 E

**MILWAUKEE COUNTY, WISCONSIN**

SET BY: Alster & Associates, Inc., Washington, D. C.

STATE PLANE COORDINATES: NORTH 325,007.70 EAST 2,577,989.20

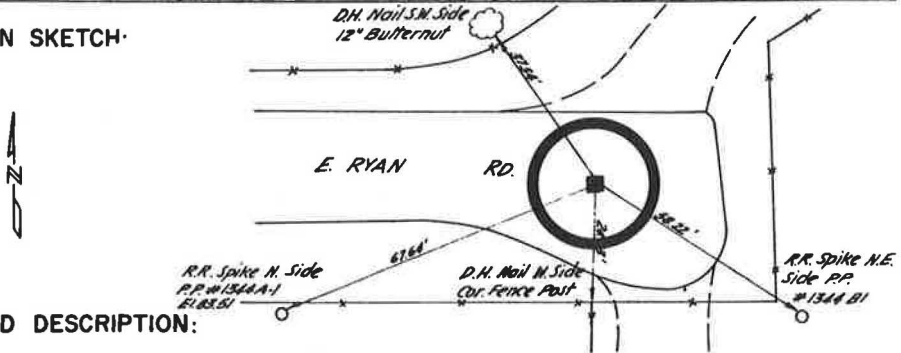
ELEVATION OF STATION: 80.12

HORIZONTAL DATUM: WISCONSIN STATE SYSTEM OF PLANE COORDINATES  
LAMBERT PROJECTION-SOUTH ZONE

VERTICAL DATUM: CITY OF OAK CREEK

HORIZONTAL & VERTICAL CONTROL ACCURACY: SECOND ORDER

**LOCATION SKETCH:**



**DETAILED DESCRIPTION:**

From South Chicago Road and East Ryan Road, drive east 0.7 mile.

**SURVEYOR'S AFFIDAVIT:**

**STATE OF WISCONSIN  
MILWAUKEE COUNTY**

I HEREBY CERTIFY THAT I found a 6" square limestone monument, 8" below the road surface.

DATE OF SURVEY June 1961 \_\_\_\_\_ S 371

**REGISTERED LAND SURVEYOR**

(1) 2

Figure 1. Typical dossier sheet for each control station.



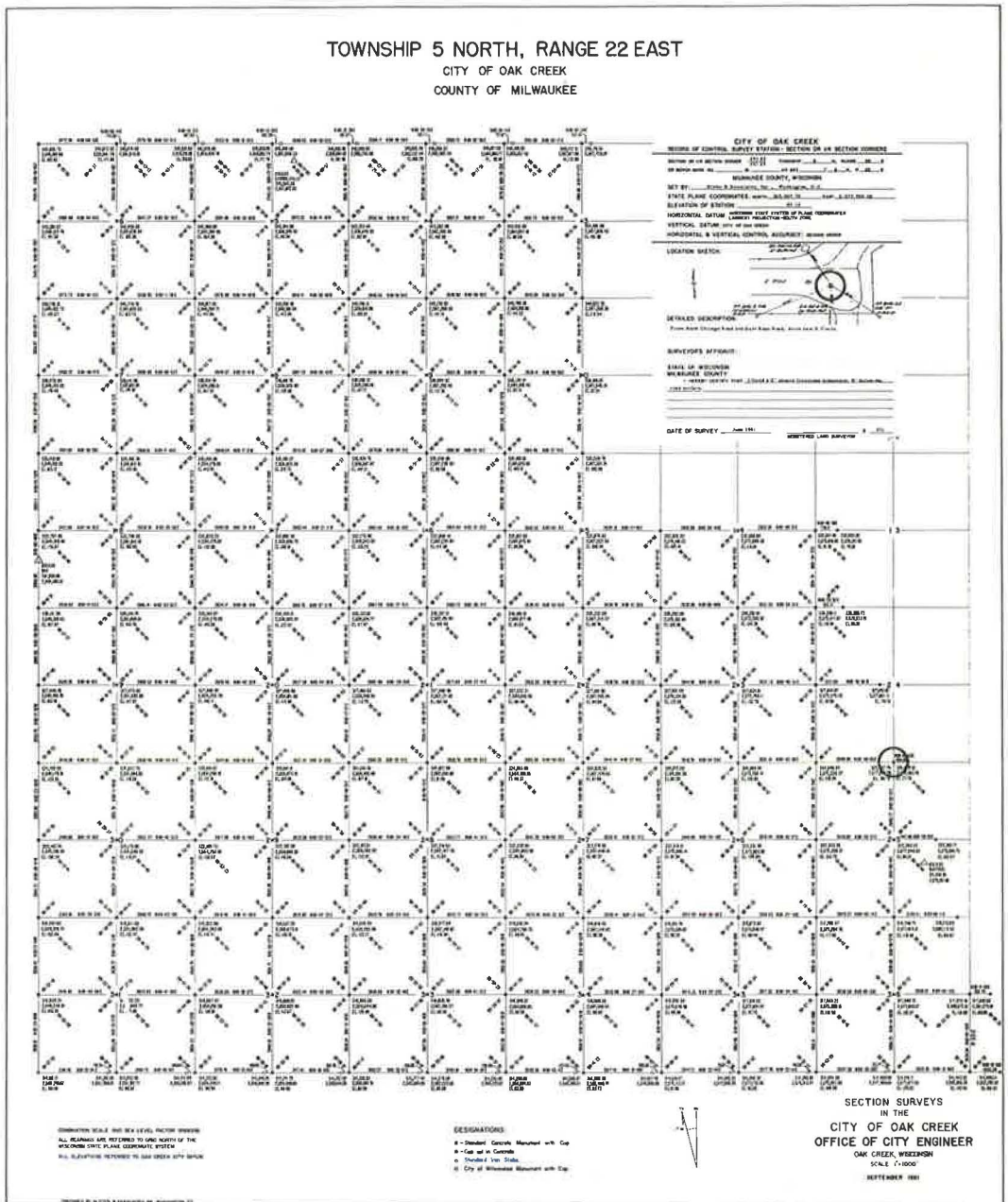


Figure 2. Completed control survey summary diagram covering entire urban area and precisely locating public land survey corners on State plane coordinate system and giving complete survey control information.

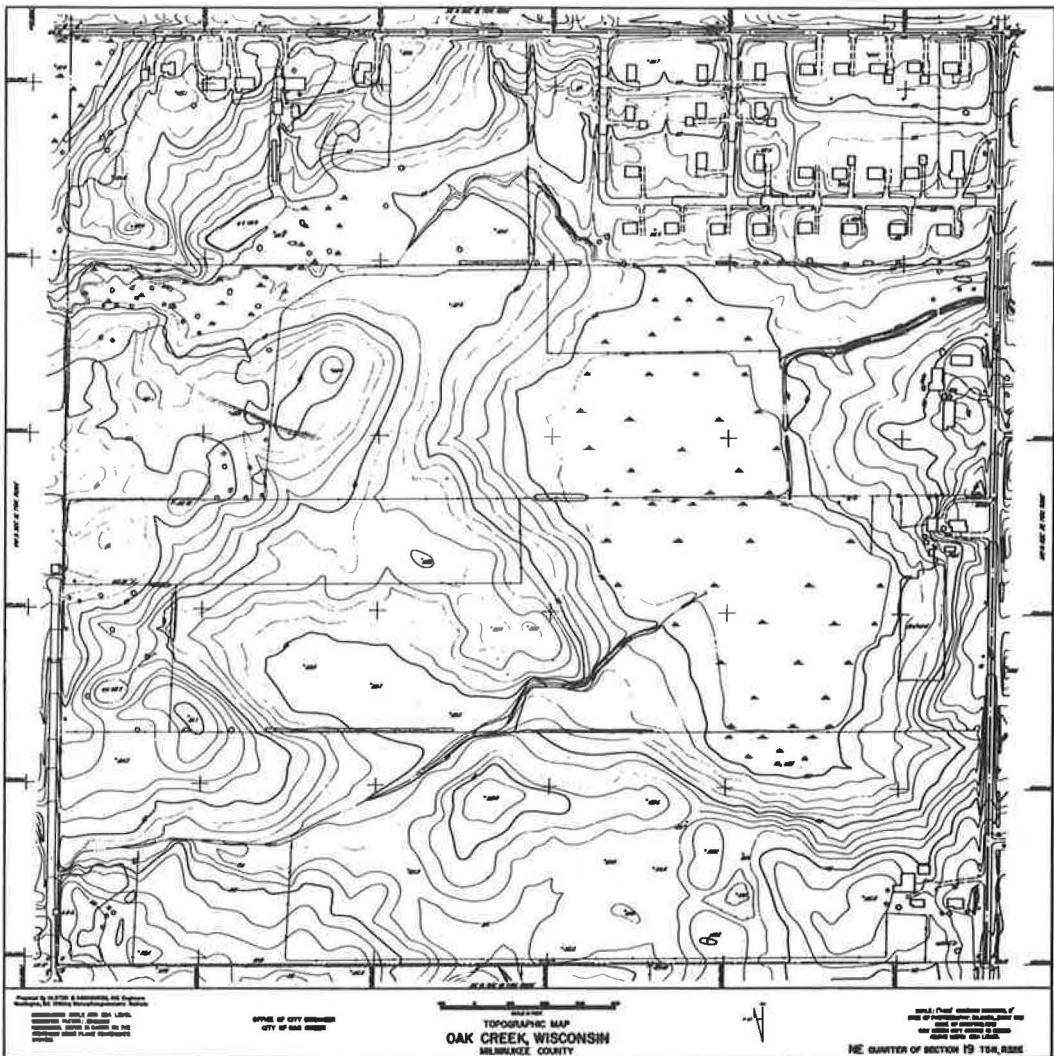


Figure 3. Typical finished topographic map sheet showing correct position and orientation of quarter-section lines and corners.

5. It permits reservation lines drawn on the official map to be accurately and precisely reproduced on the ground at the time of plan implementation or at any time prior thereto.

6. It is readily adaptable to the latest survey techniques and is of relatively low cost.

A particularly efficient and economical arrangement is to undertake an aerial mapping project as an integral part of the official mapping program. This not only supplies the topographic data necessary to the proper design of projects to be placed on the official map but affords a substantial economy in the control survey work. When it is realized that the cost of control surveys executed in the usual manner for aerial mapping projects can account for from one-quarter to one-third of the total cost of the finished maps, and when it is further realized that this control is largely unrecoverable and unusable by local engineers and surveyors, the real economy of using the control system proposed herein becomes apparent. By allocating to the control survey work a

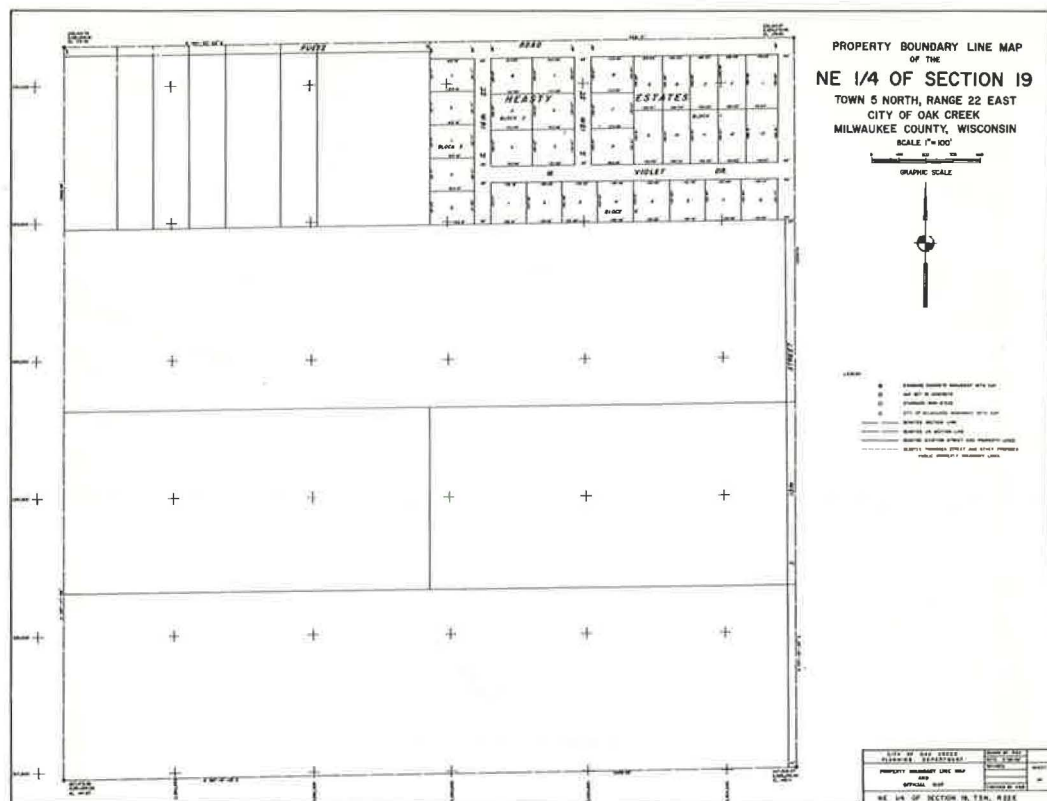


Figure 4. Typical finished property boundary line map sheet in outlying urbanizing area; property boundary lines tied precisely to State plane coordinate system, making accurate correlation with topographic maps possible.

relatively small additional amount of the total resources available for mapping, far more effective and useful finished maps can be obtained and a valuable and permanently useful system of survey control can be concurrently provided. The only significant increase in costs actually assignable to the control system proposed are solely those incurred for the relocation and monumentation of the land survey corners and the relatively small amount of additional traversing required to coordinate these corners. Experience indicates that this amounts to approximately 20 percent of the total cost of a mapping project.

The proposed survey control system to date has been used as a basis for official mapping by two Wisconsin municipalities. Both cities used almost identical specifications to govern their mapping programs and these specifications would be readily adaptable to highway purposes. These specifications required that finished photo-



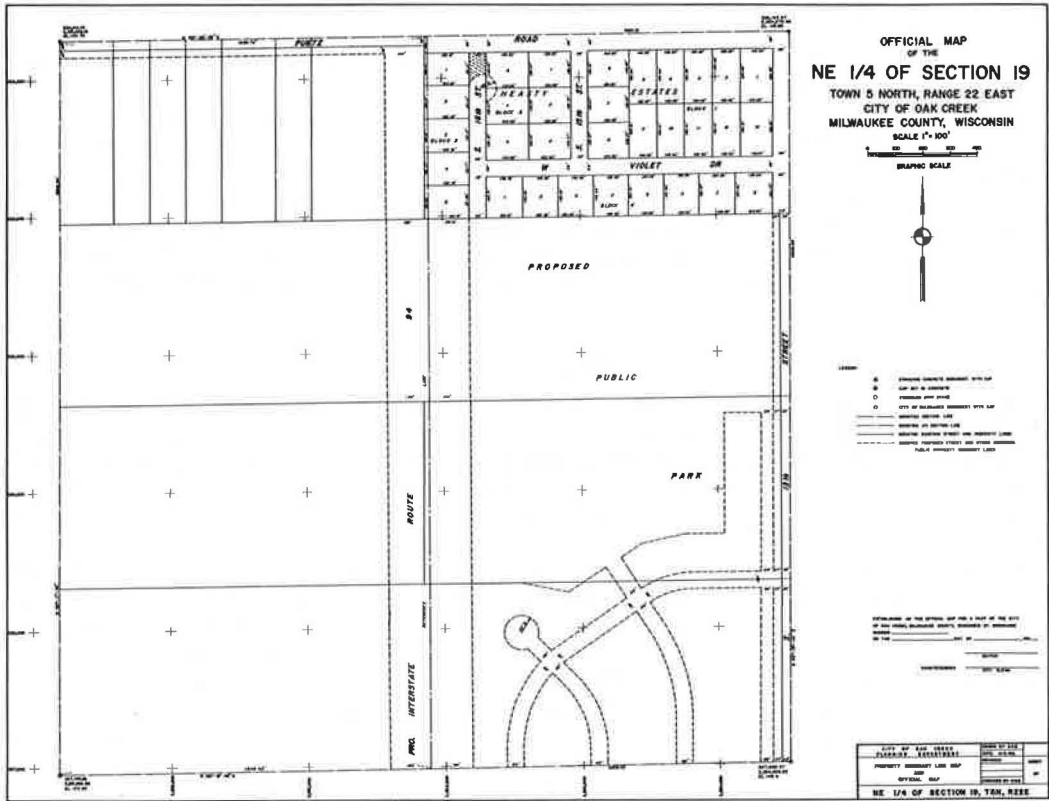


Figure 5. Typical finished official map sheet showing precise location for proposed public works projects.

grammetrically compiled topographic maps be furnished to national map accuracy standards at a scale of 1 in. equals 100 ft with a vertical contour interval of 2 ft, and that these maps be based on the survey control system proposed herein.

The specifications further required that reinforced concrete monuments, having engraved bronze caps embedded in their tops, be placed to mark the relocated public land survey corners, and that a dossier sheet be provided for each corner giving all information necessary to permit easy recovery and use. This includes a sketch showing the monument erected in relation to the salient features of the immediate vicinity, all witness monuments and ties, the State plane coordinates of the corner and its public land survey identification, and the bench mark elevation of the monument (Fig. 1). A control survey summary diagram is required showing the exact lengths and grid bearings of the exterior boundaries of each quarter-section; all monuments set; the number of degrees, minutes, and seconds in the interior angles of each quarter-section; the State plane coordinates of all quarter-section corners together with their public land

survey identification; the bench mark elevation of all corners set; basic U. S. C. and G. S. control stations used to tie the public land survey corners to the National geodetic datum; the angle between geodetic and grid bearing; and the combination sea-level and scale-reduction factor (Fig. 2).

The finished topographic maps, in addition to the usual contour information, planimetric detail, and coordinate grid ticks, also show in their correct position and orientation all quarter-section lines and corners established in the field surveys (Fig. 3). Property boundary lines are then readily plotted on the topographic maps themselves, or on separate overlays, from title records and adjusted to the quarter-section lines (Fig. 4). Specific projects may then be taken from the long-range plan, detailed as to specific location by working directly on the maps, and the maps adopted as portions of the official map (Fig. 5).

### CONCLUSIONS

The official map can fulfill an important planning function by providing a necessary and effective means of implementing both State and local arterial street and highway system plans. An official mapping program should be based on base maps of adequate precision and accuracy compiled on a framework of permanently monumented horizontal control which permits accurate correlation of real property boundary line information with topographic data.

The control survey system outlined here places a monumented, recoverable control station of known position on both the public land survey and State plane coordinate systems, and of known elevation, at  $\frac{1}{2}$ -mile intervals throughout the area being mapped, whether that area be an entire city or an existing or potential traffic corridor. This monumented control net not only permits the reservation lines established by an official map to be accurately and economically reproduced on the ground but also expedites and coordinates all survey work, both public and private, throughout the mapped area.

The official map can and is being applied to highway plan implementation in Wisconsin, both through cooperative State-local exercise of local official map powers and through newly instituted State level official map powers. Further application of this plan implementation device can probably best be encouraged by permitting Federal and State participation in State and local mapping programs which employ a system of control adequate for official map purposes. Such encouragement merits careful consideration in light of the Wisconsin experience.