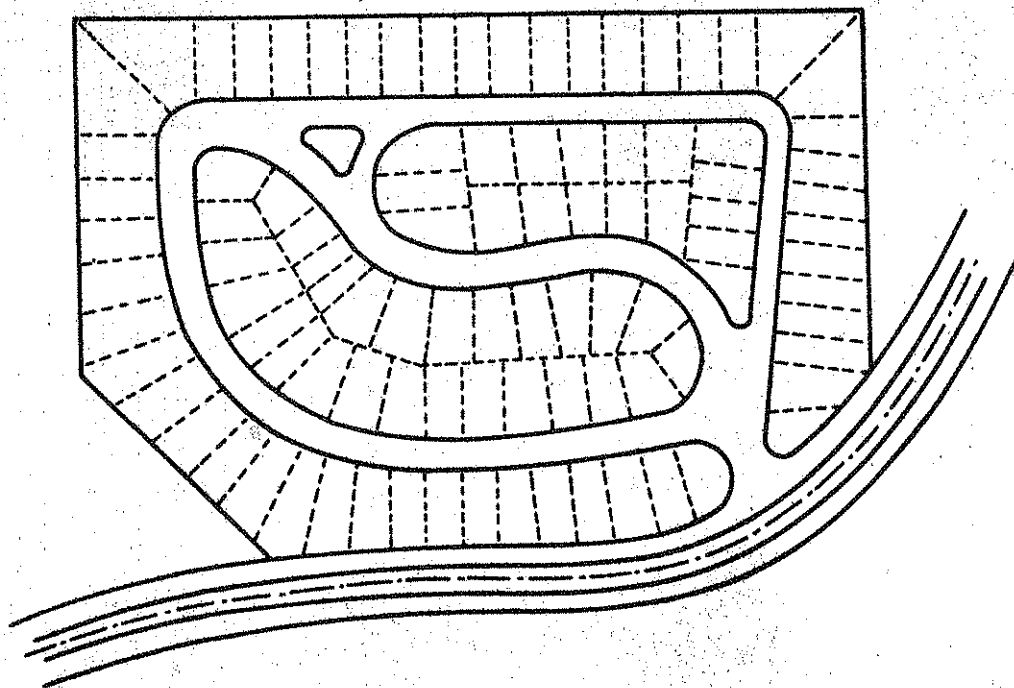


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AUGUST 1981



FINAL REPORT

Construction and Maintenance Practices to Minimize the Potential Liability of Counties for Roads in Rural Subdivisions

Iowa Highway Research Board
HR-221

ISU-ERI-Ames-82017
Project 1475

In cooperation with the
Highway Division,
Iowa Department of Transportation



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The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Highway Division of the Iowa Department of Transportation.

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Final Report

**Construction and Maintenance Practices
to Minimize the Potential Liability of Counties
for Roads in Rural Subdivisions**

**R. L. Carstens
Principal Investigator**

**S. L. Ring
Co-Principal Investigator**

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**DEPARTMENT OF CIVIL ENGINEERING
ENGINEERING RESEARCH INSTITUTE
IOWA STATE UNIVERSITY, AMES, IOWA 50011**

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EXECUTIVE SUMMARY

In an earlier research project, HR-204, the magnitude and nature of highway-related tort claims against counties in Iowa were investigated. However, virtually all of the claims identified in that research resulted from incidents that occurred in areas with predominantly agricultural land use. With recent increases in the rural non-farm population, many traditionally urban problems are also appearing in built-up areas under county jurisdiction. This trend is expected to continue so that counties must anticipate a change in the nature of the tort claims they will encounter. Problems that heretofore have been unique to cities may become commonplace in areas for which counties are responsible. The research reported here has been directed toward an investigation of those problems in rural subdivisions that lead to claims growing out of the provision of highway services by counties.

Lacking a sufficient data base among counties for the types of tort claims of interest in this research, a survey was sent to 259 cities in Iowa in order to identify highway-related problems leading to those claims. The survey covered claims during a five-year period from 1975 to 1980.

Over one-third of the claims reported were based on alleged street defects. Another 34 percent of the claims contained allegations of damages due to backup of sanitary sewers or defects in sidewalks.

By expanding the sample from the 164 cities that responded to the survey, it was estimated that a total of \$49,000,000 in claims had been submitted to all 259 cities. Over 34 percent of this amount resulted

from alleged defects in the use of traffic signs, signals, and markings. Another 42 percent arose from claims of defects in streets and sidewalks. Payments in settlement of claims were about 13.4 percent of the amount asked for those claims closed during the period covered by the survey. About \$9,000,000 in claims was pending on June 30, 1980, according to the information furnished.

Officials from 23 cities were interviewed to provide information on measures to overcome the problems leading to tort claims. On the basis of this information, actions have been proposed that can be undertaken by counties to reduce the potential for highway-related claims resulting from their responsibilities in rural subdivisions and unincorporated communities. Suggested actions include the eight recommendations contained in the final report for the previous research under HR-204. In addition, six recommendations resulted from this research, as follows:

1. Counties should adopt county subdivision ordinances.
2. A reasonable policy concerning sidewalks should be adopted.
3. Counties should establish and implement a system for setting road maintenance priorities.
4. Counties should establish and implement a procedure for controlling construction or maintenance activities within the highway right of way.
5. Counties should establish and implement a system to record complaints that are received relating to highway maintenance and to assure timely correction of defective conditions leading to such complaints.

6. Counties should establish and implement a procedure to ensure timely advice of highway defects for which notice is not otherwise received.

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Research personnel wish to extend their appreciation to the numerous city officials who responded to the questionnaires that afforded the factual input to this research. Special thanks are directed to the following city officials who consented to interviews with research personnel:

Ames: Arnold Chantland, Paul Wiegand

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Special appreciation is extended to the members of the Board of Consultants who reviewed the recommendations and made helpful suggestions for increasing their value:

William Amundson, Director of Public Works, City of Sioux City

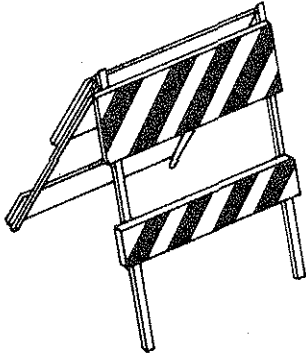
Larry Mattusch, County Engineer, Clinton County

Eldo Schornhorst, County Engineer, Shelby County

The authors, however, retain responsibility for the interpretations of factual input to the research, opinions, findings, and conclusions.

I. INTRODUCTION

Background for the Study



Chapter 613A, Code of Iowa, provides that "every municipality is subject to liability for its torts and those of its officers, employees, and agents acting within the scope of their employment or duties."

Since passage of this portion of the law, counties and cities have increasingly been defendants in actions for tort liability. Many of these claims have resulted directly from the responsibilities of local governments for planning, designing, constructing, maintaining, and operating systems of streets and highways.

It may be expected that an increasing number of highway-related tort claims in rural areas will arise from incidents that take place in built-up areas. The recent increase in the rural non-farm population and the growing number of rural subdivisions provide assurance that many problems that in the past have been unique to cities will become commonplace outside of city boundaries. It is with this expectation that the research reported here was undertaken.

Project Overview

Research Goal and Objectives

The goal of this research was to provide a set of recommendations to officials responsible for systems of streets and highways in rural subdivisions and unincorporated places. These recommendations, if

followed, are expected to reduce the potential liability of counties from street-related tort claims. Adoption of these recommendations will also lead to an improved quality of service to motorists, pedestrians, and owners of property that abuts public streets or highways. It is anticipated as well that the recommendations will be helpful to officials responsible for streets in lower-density portions of cities.

An objective of the research was to identify specific street-related problems that have given rise to claims against cities. This was based on the expectation that counties with responsibilities for built-up areas would encounter similar problems.

A further objective was to determine the corrective actions that have been shown to be effective as counter-measures to avoid or mitigate situations that typically have led to street-related tort claims. In this case also, the vastly greater experience of cities in respect to incidents in built-up areas was used as a resource to suggest corrective measures that would be appropriate for county governments facing similar incidents in rural subdivisions.

Research Approach

In order to define the problems that have been faced by cities in Iowa since their loss of sovereign immunity, a mailed survey was directed to each city in the state that was listed as having a population of 1,000 or more in 1980-81 Directory of Iowa Municipalities of the League of Iowa Municipalities. The experience of these cities was expected to be indicative of the probable impact upon counties as subdivisions spread out beyond city boundaries. A description of the questionnaire and a summary of the responses is provided in Chapter II of

this report. Other data that are of interest to cities but that may not relate directly to experience in rural subdivisions are displayed in Appendix B.

Chapter III provides a summary of the information obtained in interviews that were conducted with officials having responsibilities for the street function in 23 cities in Iowa. The findings from these interviews are summarized in that chapter.

The conclusions and recommendations resulting from this research are presented in Chapter IV. Recommendations, prior to their inclusion in the report, were reviewed by members of the Board of Consultants appointed for this purpose. Suggestions received from the Board of Consultants have been incorporated in the recommendations.

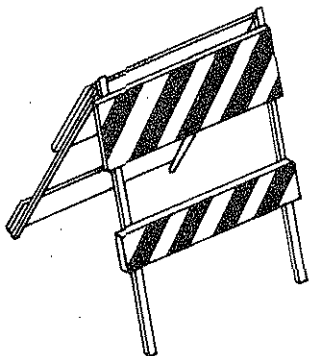
Relationship with Research Project HR-204

The Engineering Research Institute in an earlier study addressed the problems of counties in respect to their liability resulting from highway accidents. This research was accomplished for the Iowa Highway Research Board as Project HR-204. The final report from that study included information on the historical experience of counties in Iowa in respect to highway-related tort claims [1]. The report also presented recommendations intended to reduce the frequency and magnitude of such claims.

However, virtually all of the historical experience by counties has related to highway segments located in areas with predominantly agricultural land use. Very few of the highway-related tort claims that were reported resulted from accidents that occurred in the built-up areas within the jurisdiction of counties.

The results of the previous study, therefore, may not be sufficiently indicative of the types of accidents and claims that will arise as residential development spreads outside of city boundaries. Different types of problems may be anticipated, problems that may be commonplace in cities but will be unlike those previously encountered by county officials. In studying those problems and presenting recommendations to help overcome those problems, this report and the current research should be viewed as a supplement to the research and recommendations resulting from Project HR-204.

II. SURVEY OF CLAIMS EXPERIENCE



As part of the research previously accomplished under project HR-204, counties were requested to report their experience with highway-related tort claims for a six-year period, 1973 through 1978. No effort was made to identify specifically the claims arising from accidents in

rural subdivisions or unincorporated communities. Nor was it possible from the responses to segregate those claims submitted from built-up areas under county jurisdiction from those submitted from other portions of counties.

Although the premise underlying the current research was that claims to counties from rural subdivisions would tend to become more numerous in the future, it was recognized that their number would still be quite small. Hence, a survey of claims experience by cities was undertaken with the expectation that a sample of significant size could be obtained and that the types of claims encountered by cities would be quite similar to those that counties could be expected to encounter as a result of their responsibilities for streets in rural subdivisions and unincorporated communities.

The survey instrument shown in Appendix A was used for this purpose. The purposes of the questionnaire were as follows:

- To identify specific problem areas that have given rise to street-related tort claims against the cities surveyed with the

expectation that similar problems would arise in rural subdivisions.

- To determine the relative frequency of occurrence of claims and the magnitude of claims for each specific problem area.
- To establish the measures used by cities to identify potential street-related problems in order to preclude their occurrence.

The survey was sent to 259 cities in Iowa, each city that had a population of at least 1,000 as recorded in the publication 1980-81 Directory of Iowa Municipalities published by the League of Iowa Municipalities. Census figures given in this publication were for the 1970 decennial census unless a later special census had been certified to the Iowa Secretary of State. (One city with a population of 932 was included in the survey as a result of an error in listing its population.)

The survey covered the five fiscal years beginning July 1, 1975, and extending through June 30, 1980. Respondents were requested to report each claim by the year that it was submitted and the specific problem area represented. Also requested was information on the amount of the claim and the amount of any settlement or whether the claim was still pending as of June 30, 1980.

The questionnaire was pretested with four cities starting in July, 1980. The remaining 255 questionnaires were mailed during September, 1980. Questionnaires were directed to the City Attorney in a few larger cities, City Managers or Administrators for cities having such an office, and City Clerks in all other cities. Follow-up included a solicitation of assistance in urging a response directed to City Engineers or

Public Works Directors in cities that had not responded by November, 1980, and to County Engineers in those counties. These cities received a second mailing of the questionnaire.

Response to the Survey

A breakdown of the sample and the survey responses by size of city is given in Table 1. The total response rate was over 63 percent. Nearly half of the cities responding reported that they had received no street-related tort claims during the five-year period covered by the survey.

Reports received by the research staff indicated that all of the cities responding to the survey encountered difficulties in compiling the record of their claims experience, if they had any claims to report. Among the letters received from recipients of the survey, expressions such as the following were common:

"... the information sought is simply not of record in this office."

"... the City does not maintain records on such torts in a manner that yields the information you have sought."

The most suitable responses were received from cities that had full-time claims investigators.

Some of the cities that did not respond indicated that they simply could not afford the expenditure of time and effort required to search their records for the information that was requested. In some cases, it appeared that the requisite records simply did not exist.

Many cities that were insured simply turned the problem of responding to the survey over to the local agency for their insurance carrier. This proved to be suitable only if the same carrier had provided coverage

Table 1. Survey sample and responses by city size.

City Population	Number in Sample	Responses		No. Claims Reported
		Number	Percent	
Under 1,000	1	1	100	1
1,000 to 2,499	140	103	74	65
2,500 to 4,999	54	28	52	11
5,000 to 9,999	36	19	53	3
10,000 to 19,999	9	3	33	0
20,000 to 49,999	12	5	42	0
50,000 and over	7	5	71	0
Total	259	164	63	80

throughout the survey period. In some instances, however, insurance company records were available only for the most recent period of one or two years.

Data from Survey Responses

Questionnaires returned by the cities responding to the survey varied widely in the extent to which complete information was supplied. The sample size also varied slightly from year to year because some cities were able to report data for only part of the five-year period covered by the survey. Consequently, meaningful totals could be calculated only if data based on the information that was obtained was expanded to be representative of the survey sample.

As one example of incomplete information, a total of 2,233 claims were reported, but only 1,952 were quantified. In this regard, it may be noted that some claims are submitted to cities without the amount of damages specified. This is particularly likely to be the case where a claimant has sustained water damages, perhaps from a sanitary sewer backup. Often under these circumstances, the claimant is requesting that his or her property be restored to its previous condition, but does not specify the amount of damages demanded. In other cases, information on the amount of damages requested simply was omitted.

The total amount reported for the claims that were quantified was \$17,986,098. If this is simply expanded by the factor $2,233 \div 1,952$, it may be concluded that the total amount represented by 2,233 claims was \$20,575,285. However, different results are obtained, as will be seen, if the quantified claims are expanded by problem area or city size or by year submitted or by some combination of these.

In Table 2, values for claims and amounts claimed are shown by problem area. The claims for which an amount was not reported were assumed to have the same average values as those reported for the claims that were quantified.

A breakdown by the year that the claim was submitted is displayed in Table 3. It may be noted that the values shown for the total amount of claims and the average per claim are different in Tables 2 and 3 for the reason given previously. Table 4 presents expanded data based on the information received from the 164 cities that responded to the survey. This has been done in order to estimate the total amount of claims that have been received by all of the 259 cities covered by the survey.

Table 2. Summary of claims by problem area.

Problem Area	Total Number	Claims Percent	Amount Claimed		Average Per Claim, \$	Proportion of Claims Paid	Proportion of Claimed Amount Paid
			Total, \$	Percent			
Street defects	747	33.5	4,311,279	20.7	5,571	0.388	0.107
Sidewalk defects	323	14.5	4,477,882	21.5	13,863	0.705	0.110
Storm water flooding	85	3.8	992,440	4.8	11,676	0.308	0.114
Sanitary sewer backup	437	19.6	832,377	4.0	1,905	0.508	0.125
Traffic signs, signals, etc.	96	4.3	7,128,131	34.3	24,010	0.700	0.025
Traffic control during maintenance	106	4.7	434,918	2.1	4,103	0.597	0.276
Failure to remove ice or snow	93	4.2	1,221,026	5.9	13,129	0.625	0.058
Railroad crossing problems	38	1.7	309,458	1.5	8,144	0.833	0.530
Water service problems	118	5.3	271,030	1.3	2,297	0.778	0.326
Other	190	8.5	832,346	4.0	4,381	0.893	0.492
Total	2,233	100.0	20,810,887	100.0	9,320	0.560	0.134

Table 3. Summary of claims by fiscal year.

Year	Number of Claims	Amount of Claims, \$	Average Claim, \$
1975-1976	362	1,169,223	3,230
1976-1977	347	2,177,302	6,275
1977-1978	464	9,754,436	21,022
1978-1979	414	2,664,398	6,436
1979-1980	646	4,974,563	7,701
Total	2,233	20,739,922	9,288

Table 4. Expanded total claims and claims pending by city size.

City Size	Total Cities	Total Claims	Average Per City	Amount Claimed, \$	Average Per City	Average Per Claim, \$	Claims Pending	Amount Pending, \$	Average per City, \$	Average per Claim, \$
1,000-2,499	141	110	0.78	2,650,000	18,800	24,000	12	512,000	3,600	41,300
2,500-4,999	54	148	2.75	1,338,000	24,800	9,000	21	833,000	15,400	39,300
5,000-9,999	36	422	11.72	2,667,000	74,100	6,300	50	681,000	18,900	13,500
10,000-19,999	9	201	22.33	20,650,000	2,294,500	102,700	15	13,000	900	1,400
20,000-49,999	12	768	64.00	11,148,000	929,000	14,500	34	3,208,000	267,300	95,500
50,000 or more	7	2,451	350.24	10,535,000	1,504,000	4,300	140	4,025,000	575,000	28,800
Total	259	4,100	15.84	48,988,000	189,100	11,900	272	9,272,000	35,800	34,000

These data also cover the five-year period from July 1, 1975, to June 30, 1980, broken down by city size class.

For the data in Table 4, the average amount per claim and the average number of claims per city from the survey responses were assumed to be representative for each city size class. The expanded numbers were then calculated by multiplying the sample data by one or both of the following ratios:

$$R_1 = \frac{\text{Total number of claims}}{\text{Number of claims that were quantified}}$$

$$R_2 = \frac{\text{Total number of cities in size class}}{\text{Number of cities that reported claims}}$$

An expansion factor similar to R_1 has been used to calculate the total amount claimed as displayed in Tables 2 and 3.

To illustrate the calculation of the values in Table 4, consider the size class from 2,500 to 4,999. Fifty-four cities with populations in this range were contacted. Of these, 28 returned completed questionnaires. These cities reported 77 claims of which 65 were quantified. The claims that were quantified were in the amount of \$585,444. Given these figures, the following may be calculated:

$$\text{Average claims per city} = \frac{77}{28} = 2.75$$

$$\text{Average amount per claim} = \frac{585,444}{65} = \$9,007$$

$$R_1 = \frac{77}{65} = 1.185$$

$$R_2 = \frac{54}{28} = 1.929$$

$$\text{Average amount per city} = 9,007 \times 2.75 = \$24,769$$

Expanded number of claims = $77 \times 1.929 = 148$

Expanded amount of claims = $585,444 \times 1.185 \times 1.929 = \$1,337,514$

These figures have been rounded for display in Table 4. Also shown in Table 4 are the number of claims pending as of July 1, 1980, and the amounts of these claims, expanded in a similar manner.

Interpretation of the Responses

Because of the nature of the data obtained from the questionnaire, detailed analyses of averages or trends may yield misleading results. One or two claims for several million dollars each can seriously distort average values. The validity of detailed analyses is also diminished by the fact that some cities could not report their claims experience for more than part of the five-year period for which data were requested. Thus, the sample size varied from year to year.

As an example of a possible aberration in the data, it may be noted in Table 4 that cities having 10,000 to 19,999 population reported larger dollar amounts of claims than cities with populations over 50,000. Such a situation is not likely to occur in the long run. Recognizing that a rigorous analysis of the data would be likely to yield misleading conclusions, the observations that follow are based largely on a subjective interpretation of the data rather than rigorous analysis.

As one would expect, the number of claims received varies with city size, larger cities receiving more claims than smaller cities. However, the relationship is nonlinear. Cities of over 50,000 population received about four claims per 1,000 population during the five-year study period.

Cities with populations up to 5,000 received fewer than one claim per 1,000 population during the same period. The total number of claims submitted to all of the cities responding to the survey has tended to increase from year to year at an annual rate of about 20 percent.

The average size of a claim tends to be larger in the small cities, however. As a result, the average per capita amount of claims in a large city is only slightly larger than in a small city, the result of a greater number of smaller claims. The total amount of all claims submitted to all cities has tended to increase somewhat over time, probably at about the rate of inflation during this period.

The proportion of claims on which some payment is made is indicated by problem area in Table 2. Considerable differences may be noted. This proportion also varies substantially by city size. Cities with populations under 5,000 tend to settle most claims (95 percent) by making some payment. On the other hand, fewer than half (48 percent) of the claims submitted to cities with over 50,000 population result in some payment to the claimants.

Data on the proportion of the claim that is paid in settlement tend to be quite erratic by city size. However, the general trend is indicated by the fact that cities with populations from 1,000 to 2,499 reported settlements equal to 32 percent of the amounts claimed. For the largest size class, on the other hand, cities settled claims at a payout rate of about 6 percent. The overall rate reported, 13.4 percent, was quite similar to the 12.2 percent payout experienced by counties for highway-related claims as reported in Reference 1.

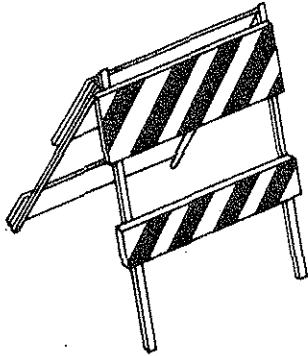
As indicated in Table 2, the largest number of claims in any problem area was reported for street defects. Claims in this category represented about one-third of the total number reported. However, these claims resulted in less than 21 percent of the demands in terms of dollars. Claims resulting from sidewalk defects, although much less numerous, resulted in a larger amount claimed.

Only about 4 percent of the total claims were reported in connection with traffic signs, signals, and other traffic control devices. However, these relatively few claims represented over one-third of the total amount claimed. Although this figure is distorted by a few claims for several million dollars each following motor vehicle accidents, it is believed to suggest correctly the extremely high potential liability that arises from alleged inadequacies in the use of traffic control devices.

Some 190 claims were reported that did not fit into one of the nine specific problem categories that were suggested to respondents. Most of these were quite small. The majority that were described resulted from dead or decayed trees in the street right of way falling on cars or other property. Several claims in this category were reported that resulted from city employees either spraying asphalt or plowing snow in such a manner as to cause damage to automobiles. Alley defects were reported by a few cities as resulting in claims. The only very large claim among the many others reported in this miscellaneous category was one resulting from a gas line explosion in the street right of way.

Some of the additional information that is not particularly relevant to authorities responsible for rural subdivisions is included in Appendix B.

III. INTERVIEWS WITH MUNICIPAL OFFICIALS



Change from agricultural land use to any more intensive use is accompanied in turn by an increase in vehicular traffic and greater complexity of the driving task.

The development of rural subdivisions exemplifies such a change. Concentrations of population result in greater numbers

of pedestrians, bicycles, driveways, traffic control devices, and underground and overhead utility services. As a result, the potential for tort liability is much greater than in a comparable area with predominantly agricultural land use.

To gain further understanding of the problems and management concepts for providing highway services in these developments, interviews were conducted with officials in 23 cities. The following cities in which the interviews took place represent a range in terms of both city size and geographical distribution within the state:

Ames	Clinton	Fort Dodge	Storm Lake
Bettendorf	Creston	Marion	Waterloo
Cedar Falls	Davenport	Mason City	Waverly
Cedar Rapids	Denison	Muscatine	Webster City
Cherokee	Des Moines	Ottumwa	West Des Moines
Clear Lake	Dubuque	Sioux City	

Interviews

Information obtained in interviews provided significant input for this research. Although the interviewers did not use a structured set of questions, the discussions with officials in each city were directed so as to cover the same areas of concern and provide comparable information from each city. One of the persons interviewed in each city was the Public Works Director or City Engineer. Persons holding both of these titles were interviewed in some cities. The Traffic Engineer (or comparable position) was interviewed in four cities. In three cities, the City Attorney or an assistant was also interviewed. Other interviewees held various positions with responsibility for some aspects of providing service on a municipal system of streets.

Street Repair Programs

Engineering forces in most cities are aware of the streets in need of repair. In some cases a detailed condition inventory exists for all streets and is the basis for priorities and the development of a capital improvement program. In other cases a survey is conducted, either one time in the early spring or on a continuing basis, and the streets in need of repair are identified for improvement.

Usually the final improvement programs are established by the council based on input from the engineering department. Priorities may be changed, especially as reduced street improvement funding occurs and political pressures are exerted.

The correction of spot hazardous street conditions, such as potholes, may have a high priority or a low priority depending on the

concern of those involved. A weekend alert person is available in some cities on a stand-by basis to make emergency repairs. Generally the complaint is received or initiated by the police who notify the public works alert individual. The police in one city carry miniature barricades in their trunks to take care of hazardous situations before the repair is effected. In the more usual case the pothole repair is conducted after a complaint is initiated and when manpower is available. The degree of urgency implied by the complaint may speed up the action.

Pavement Cuts and Street Excavation

Whenever underground utilities exist in the street right of way or service lines must cross the street right of way, access to the system will eventually be required. The pavement surface must be removed, excavation completed, the repair or service connection made, backfill completed, and patching of the surface completed. Two major areas for traffic hazards exist in this type of operation. First, the hazard that exists for traffic due to the closing of a portion of the traveled way is of concern. Numerous serious accidents were reported, many because of allegedly inadequate traffic control. Such problems as inadequate or missing signs, missing barricades, lamps that were not operating, and other shortcomings were reported.

A second potential problem is the adequacy of backfill compaction and surface restoration. Many cities reported problems with potholes or dips resulting from improperly executed backfill or patching.

Placement of the responsibility for traffic control at an excavation in the street varies among cities. In some cases the city assumes responsibility for traffic control and in others the contractor, utility,

or other person doing the work is responsible. The requirements may vary considerably, and in fact are not well documented and defined in some cities.

The responsibility for backfill and surface restoration also varies among cities. In some cities the contractor is required to take care of the backfill and the patching whereas in other cities the municipal forces do the backfilling and pavement patching and assess the costs to the contractor.

Curb Cuts and Driveway Construction

Most cities have traditionally used a curb at the edge of the pavement to confine storm water flow to a paved channel. A 6-inch high curb is common and provides a positive barrier between vehicular traffic and pedestrians and precludes vehicular use of the adjacent areas. Also, most cities exercise access control wherein driveways are regulated as to location and dimensions. Some cities have adopted low curbs (3 inches) to reduce the need for curb cuts or drops at driveways. One community reported a low curb was adopted to allow vehicles to park as desired back of the curb.

Many cities allow the property owner to remove a portion of curb to construct a driveway. Some require a pavement cut at the face of the curb at a specific location and specify how the curb is to be removed. On the other hand, some cities allow curb removal only by city forces in order to control the construction and bill the property owner for costs.

The paving of driveways inside the right of way may be by the property owner in some cities whereas others require a licensed concrete contractor to do all work inside the right of way.

Sidewalks

Cities are concerned with two aspects of pedestrian facilities: first, when and where to require sidewalks and second, how to identify deficient sidewalks and how to achieve their improvement to suitable standards.

The majority of the larger cities visited require sidewalks for new development under subdivision regulations. Generally the location is back of the curb and in the right of way on both sides of the street. It was occasionally reported that sidewalk requirements were waived on request. Also, a number of subdivision ordinances made sidewalks optional.

In existing development the concern for lack of continuous sidewalks, where pedestrian traffic is significant, varies markedly among cities. Some take action to force sidewalk construction if a request is received from a group of citizens such as a school safety committee. In the more common response the city tends to ignore requests from individual property owners for sidewalk construction, but will act if a significant majority exerts pressure for sidewalks on a school route.

Sidewalks that are broken or distorted and a hazard to pedestrians are not uncommon. In many cities the sidewalks are over 50 years old and have suffered from tree roots, heavy vehicles, and the elements. However, only two of the cities that were contacted have definitive standards for identifying a hazardous sidewalk. These ordinances specify the vertical displacement or broken area considered hazardous. Many city engineers have rule-of-thumb standards.

The identification of hazardous sidewalks usually is dependent on complaints. Sidewalk falls are one of the more common potential tort liability occurrences in cities. The injuries usually are not severe, and frequently are settled by insurance carriers or by negotiation and seldom reach the litigation level associated with severe vehicular accidents. Some larger cities have full-time sidewalk inspectors. In several others, mail delivery persons routinely report hazardous sidewalks to the engineering department.

Some cities reported a sidewalk survey to inventory sidewalk conditions. A frequent comment received had to do with the frustration that developed when the council refused to take action to correct known deficiencies. A number of cities reported that they had discarded their sidewalk condition inventories because knowledge of a defect without the ability to force the repair created a legal position that was untenable.

An isolated case of a pedestrian fall was reported relating to a planter placed in the sidewalk. The planter base allegedly created a hazard in the normal pedestrian walkway. Numerous obstructions of this nature are appearing in business districts.

Most sidewalk ordinances establish the responsibility of an abutting property owner for a "safe and hazard free condition" (albeit without definitive standards), based on Code of Iowa, Section 364.12. Usually a subsequent regulation provides for accomplishing repair in the event of noncompliance in accordance with the Code.

The property owner must be served notice, usually by certified mail, requiring repair or replacement in a reasonable time. Some cities allow the property owner to grade, form, place, and finish the concrete

sidewalk usually according to specifications of the engineering department. A hold-harmless bond may be required. Some cities reported a maximum replacement area (e.g., three panels) constituting repair, as distinguished from reconstruction, with the property owner not being permitted to undertake reconstruction. A number of cities require that all sidewalk construction, reconstruction, or repair be done by a licensed contractor. One city requires sidewalk contractors to impress a die in the concrete at each end of the work identifying that contractor as the constructor of the sidewalk.

One city reported that a major sidewalk improvement effort was accomplished under a HUD Block Improvement Grant. The same city provides the grading, forming, placing, and finishing of any sidewalk repair if the property owner purchases the concrete. This city seemed unusually concerned with improving pedestrian conditions.

If a property owner fails to repair, replace, or reconstruct sidewalks as designated by the notice served, the city may take action to have the work completed and bill the property owner for the costs. If the property owner fails to pay, the costs may be assessed in the same manner as a property tax. Repair or reconstruction of sidewalks may be by municipal forces, by a contractor hired by the city, or by the owner, commonly under bond. One city awards a contract annually to provide in advance for all sidewalk construction or reconstruction that may arise during the year.

Storm Drainage Considerations

Some cities reported occasional problems from storm water flooding because drainage facilities are unable to remove the flow in the street.

Other problems mentioned arose when a storm water inlet no longer conformed to the roadway cross-section. Resurfacing of the street is usually shaped into the existing storm sewer inlet and ultimately may result in an unsafe vertical distortion in the cross section. Also, because inlet wells are deeper and constructed on undisturbed soil, whereas the pavement is placed on soil that has been compacted, a settlement problem frequently develops. Occasionally the curb canopy on curb opening inlets fails and creates a hazard.

One city reported an alleged hydroplaning incident resulting from allegedly inadequate street surface drainage. This hazardous condition can lead to a complete loss of braking or steering capability of a vehicle.

A number of cities reported claims for injuries occurring when a bicycle wheel dropped into a parallel grate inlet slot causing the rider to fall. Current provisions of the Code of Iowa require cities to modify existing unsafe grates or to replace them with facilities of safe design.

Traffic Control Devices

The recognition of a hazardous traffic control situation and the subsequent response varies according to the emphasis received from engineering management. The degree of expertise available and understanding of the special importance of these potential hazards varies markedly among cities. A missing stop sign or a malfunctioning traffic signal is no more important than the routine repair of potholes to some. In other cases the concern for immediate action is so important that a regularly scheduled survey of major traffic control elements is conducted

simply to be aware of defects and malfunctions before a major traffic accident occurs.

Processing Complaints

Every municipality receives complaints. These complaints may be in the form of a telephone call or a face-to-face communication. The recipient may be any member of the city staff, engineer, manager or administrator, secretary, mayor, or the police (especially at night or on weekends).

A complaint usually relates directly to a potential tort liability situation and may in fact come as a result of an accident or a near accident. Unsafe sidewalks, potholes in streets, no barricades at excavations, and malfunctioning traffic signals are examples. These complaints constitute notice to a city and may have far-reaching implications.

The manner in which complaints are received, documented, processed, and recorded varies considerably among cities. In some cases, no formal process has been established and the procedure varies according to the whims of the individual contacted. Oral directions to an assistant or a few penciled notes on a scratch pad for interdepartmental instruction may constitute the internal communication. The results of the investigation of the alleged situation and its final resolution are often lost.

On the other hand, a number of cities reported a strong concern for the importance of a complaint. In these cases, a log was maintained using a standard report form for all complaints received by any staff member. Appropriate investigative activity was required, the immediacy of which was based on the nature and seriousness of the communication.

Documentation of the final action was recorded, and the entire record was filed for future retrieval if necessary. (A sample complaint form is included in Appendix D.)

The action taken on complaints received at nights or on weekends varies considerably. A few cities reported that a stand-by public works individual was on call for a complaint that required immediate action. This individual was paid on an overtime basis for time spent on the job when contacted by the police. Malfunctioning traffic signals, missing regulatory signs, and barricades removed are examples of complaints that would generate immediate action.

Miscellaneous Comments

The responsibility and the liability for snow and ice removal from sidewalks is of serious concern to all cities. Recent legal interpretations and subsequent legislative actions have emphasized the importance of this function. If a property owner does not remove snow and ice within a reasonable time, the city removes the snow and ice or sands or salts and bills the property owner for the costs.

When action is effected, how it takes place, and the details of billing the property owner vary among municipalities. A number of interviewees reported a concern for the inability to staff and equip municipal forces adequately to carry out this responsibility and the inability to charge a fully allocated fee.

The policies involved in snow removal and salting of ice spots on streets were frequently noted as having profound economic impacts. Decisions need to be made in advance as to the snow accumulation that warrants the use of snow plows and the priority assigned to various

routes. The amount of salt to use and the timing of its application are equally important decisions that are closely allied to the availability of funds. A few cities subscribe to weather forecasting services in order to plan their winter maintenance activities more effectively.

Most municipal public works functions have inherited some alleys. Alleys are usually found only in the older portions of a city since modern subdivision regulations do not recommend the use of alleys. The maintenance effort devoted to alleys varies among cities. In the central business districts of larger cities the use of alleys by both vehicles and pedestrians may be quite intensive. These alleys receive periodic inspection and surface maintenance and storm water inlet maintenance as needed. Frequently the maintenance priority may be lower for alleys than streets, especially for snow and ice removal.

Records of Tort Claims

The matter of keeping records of tort claims was discussed with officials from a few cities. Some cities had no central file of claims, especially those cities with liability insurance coverage. The officials interviewed in these cities were not particularly troubled by the lack of such records. However, without knowledge of their claims experience, cities without records of claims recognized that they had no basis for evaluating the premiums that they were charged for liability insurance.

On the other hand, cities that were self-insured generally had some form of records that enabled them to render periodic reports on claims experience to their councils. These records generally were not in sufficient detail to permit an identification of specific problem

areas that might warrant attention. Officials of some cities indicated to research personnel that they intended to revise their record-keeping so that information similar to that requested for this project would be readily at hand for their own use.

Summary

Some of the information obtained in the interviews with city officials clearly would not be relevant to the responsibilities of county officials. There are obvious differences between counties and cities in the manner in which a highway system must be managed. However, there also are many problems common to both types of local government. Consequently, information from city officials has been related with the expectation that county officials can make their own assessments as to which portions can afford them useful guidance in discharging their responsibilities for streets in rural subdivisions and unincorporated communities.

In the process of interviewing individuals concerned with managing the multiple municipal public works functions, it was apparent that responsibilities for these activities often are fragmented. Responsibility for traffic control functions may rest with the police or the engineers or, in the case of traffic signals, with a private utility. Permits for street excavations may be administered by a building permits office, street department, engineering office, traffic engineering office, or a combination of several offices, both public and private. Even street maintenance functions may be divided among the street department, the police department, and traffic and engineering offices.

The systematic sufficiency evaluation of street conditions, the identification of need for and the performance of routine maintenance, the establishment of priorities for capital needs, and the development of a capital improvement program are regularly carried out by most cities. However, the procedures vary widely. A number of cities maintain an up-to-date inventory of all street conditions. Frequently all streets are reviewed and analyzed each year for maintenance, seal coating, or reconstruction needs. Usually the public works personnel make recommendations of needs ordered by priority to the elective officials concerned with policy decisions, who in turn formulate the final capital improvement program. Forms, guidelines, and procedures for accomplishing these activities have been developed and are readily available.

One of the more frustrating situations in the management of municipal public works is the lack of support for sidewalk improvement programs. In numerous interviews it was reported that elected officials waived sidewalks required under subdivision regulations. Also, it was common to hear that councils would not cause sidewalk repairs to be completed where a property owner had failed to make the repair as notified by the municipality. In more than one case, the public works department has discarded a sidewalk condition survey and improvement analysis schedule because there was no support for requiring the property owners to make the repairs.

Only two cities indicated that their organization included a full-time person specifically responsible for investigating claims against the city. According to officials in these cities, a claims investigator position can be justified economically in a larger city that is

self-insured. Such a justification presumes that the investigator not only investigates claims but also makes a realistic assessment of the potential liability and advises the council accordingly.

Officials from some cities noted the value of standing committees to provide liaison between departments and agencies and to function as a diagnostic review group. Utilities coordinating committees meet regularly to discuss the varied interests of the participants and to review such items as excavation and backfill, traffic control, and pavement patching procedures. Traffic committees provide a diagnostic review of accidents as well as coordination and liaison between groups.

In addition to contacts with city officials, claims managers from three commercial carriers of liability insurance were contacted. Each of these companies currently writes insurance for municipalities in Iowa. All of the carriers employ some safety engineers or inspectors who carry out safety inspections and can assist municipalities in developing safety programs.

No insurance company claimed that their safety inspections of street systems or sidewalks were either rigorous or comprehensive. However, some public buildings or shop facilities might be inspected more thoroughly. One of the carriers has written standards that define some sidewalk defects, although there is no indication that this standard has been used in a meaningful way in performing inspections of sidewalks in a city.

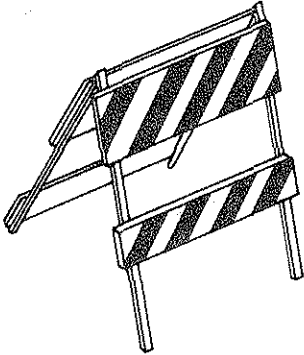
A discussion was also held with a representative of the Safety Group Insurance program. About 60 cities reportedly participate in this program in a cooperative effort to improve loss experience and

thereby reduce the costs of liability coverage. One principal objective of this program is to encourage participating cities to establish their own risk management programs.

A risk management program is based on the concept that most activities undertaken by municipalities involve certain risks of liability and that an assessment of this risk should enter into the decision-making process along with other considerations of potential costs and benefits. Responsibility for risk assessment under such a program is assigned to a special committee of municipal officials appointed for that purpose. Concern for risk management would be applicable for county governments as well as for city governments.

IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions



Problems relating to rural subdivisions vary widely depending upon the nature of the subdivision and its location. In many cases, a rural subdivision is merely an extension of a contiguous city. Such subdivisions may vary little in physical appearance from those within the city. The street-related problems encountered may be indistinguishable from those commonly experienced by city governments. Because of its location, city and county governments may share responsibility for approval of the subdivision plat, although the liability will accrue to the county for problems encountered subsequently.

Other rural subdivisions may differ quite substantially from those in cities. Development may be less dense and the usual urban appurtenances such as curb and gutter, sidewalks, street lighting, and water and sewer systems, may be completely lacking. Some of these rural subdivisions are merely strip developments along an existing highway. Others may have separate street systems with at least some of the features of an urban subdivision. Each county also includes some unincorporated communities with characteristics and problems similar to those of rural subdivisions.

All rural subdivisions and unincorporated communities are characterized by an intensified level of vehicular activity in comparison

with more typical roads in county systems that serve predominantly agricultural land use. This suggests a greater probability for the occurrence of traffic accidents and a corresponding increase in the potential for tort claim liability resulting from travel in rural subdivisions. It is important, therefore, that an extremely high level of care be exercised in the construction and maintenance of highway facilities in the more intensely developed portions of counties that are outside of incorporated communities.

This, in turn, suggests that the specific recommendations included in the Final Report, "Safer Construction and Maintenance Practices to Minimize Potential Liability by Counties from Highway Accidents," Project HR-204, need to be followed in the context of rural subdivisions and unincorporated communities.

A considerable potential exists for a county to reduce its liability growing out of occurrences in rural subdivisions by anticipating problems before they arise. For example, many problems arising from unsuitable street layout or inadequate drainage design can be addressed and solved before a subdivision plat is approved. Counties are permitted a nominal amount of control over subdivisions under the provisions of Section 306.21, Code of Iowa. However, many important aspects of subdivisions are not specifically covered by this code section but can be provided for in a subdivision ordinance. The availability of such an ordinance is particularly beneficial because it permits meaningful review of the plats for those subdivisions located more than two miles from cities with subdivision regulations.

Some of the more troublesome problems faced by cities relate to the provision of sidewalks. As indicated in Table 2, over 20 percent of all reported payments for street related claims fall in the category of "sidewalk defects." Although subdivisions lying more than two miles from city boundaries would not usually have sidewalks within the highway right of way, sidewalks may be required in subdivisions developed to conform with ordinances promulgated by a city. These sidewalks will represent a maintenance problem and a potential source of liability for counties.

In response to these kinds of problems, some cities have adopted strict standards by which to evaluate their sidewalks. (See Appendix C, for example.) A few cities vigorously carry out programs of sidewalk improvement and repair. For such a program to be successful, a governing body (City Council or County Board of Supervisors) must maintain a firm stance in the face of the often vehement opposition from property owners who object to the costs accruing to them for sidewalk construction or reconstruction or repair. The findings of this research indicate that relatively few City Councils have been willing to sustain the firm position that is needed to enforce a meaningful sidewalk ordinance. However, there was no indication that the positions adopted in this regard have been based on a realistic assessment of the degree of risk associated with continuing to use defective sidewalks.

Equally suitable responses to sidewalk problems have been evinced by cities or counties that have taken positions at either end of a continuum of possible positions relative to sidewalk repair. At one end are those governments that largely ignore sidewalk defects and

neither inspect them nor cause their repair. At the other extreme are those governments that strictly enforce compliance with concisely stated regulations dealing with sidewalk maintenance and repair. Most cities assume a position somewhere between these extremes. The overriding consideration is that the policy adopted must reflect the desires of the constituency served and a deliberate assessment of the degree of risk involved. From the standpoint of liability, an unsuitable response to sidewalk problems appears to be the one that includes regulations setting extremely high standards for sidewalk maintenance but does not follow with meaningful enforcement of these regulations.

Highway defects occur with such frequency and regularity that it is not reasonable to expect that all of them can be remedied immediately. However, the exercise of reasonable care in the maintenance of a system of highways suggests that there should be a systematic approach to the establishment of maintenance priorities. Those cities and counties that have adopted a maintenance management system are much better prepared to address the settlement of tort claims than jurisdictions without such a system. Such a system is intended to establish priorities for maintenance based on the degree to which a defective condition detracts from the safety of a facility and its capability for providing service.

In urban areas, it is common to require that a permit be issued by the city before a contractor, developer, or person repairing utility installations is permitted to undertake construction or maintenance activities within a street right of way. Some cities also require a street occupancy bond. This permits city authorities to become aware of such activities and to exert control over work site protection and

quality of the work. Section 319.14, Code of Iowa, requires that a similar permit be obtained from a county before any person may "excavate, fill or make any physical change within the right of way of a public road or highway" under county jurisdiction. The laying of water mains in highways or the secondary road system requires the approval of the Board of Supervisors in accordance with Section 320.04. However, it is not clear that the counties always exercise their statutory responsibilities for work in a highway right of way.

In order to sustain a tort claim arising from a highway defect, a claimant may be required to demonstrate that the highway authority had notice of the alleged defect. Constructive notice can be established on the basis that a highway authority should have been able to foresee that a defect could reasonably be expected to arise following the occurrence of some other events. However, actual notice requires a written or oral communication that advises an appropriate official of the highway authority of the defective condition. Many cities and counties establish and maintain a permanent record of complaints relating to highway defects. Obviously, such a record that is available for public inspection makes it easier for a claimant to demonstrate that there was actual notice if notice was in fact afforded. However, a record is essential in the more usual case where there had not been actual notice. In this case, the highway authority will be able to refute such a claim by showing that the records, including all complaints actually received, do not substantiate a contention that the highway authority had been notified.

In order to minimize the potential for tort liability, it is essential that a highway authority have an established system for surveillance. Responsible persons must be made aware of troublesome or defective conditions as they occur. Missing signs, washouts, potholes, pavement blowups, dangerous ice accumulations, mud on the highway, and clogged drainage conduits are but a few of the potentially hazardous conditions that can arise suddenly and unexpectedly. The ability to correct these conditions in a timely manner is dependent upon immediate reporting of their existence. Employees of a county road department represent a particularly valuable resource for reporting conditions that they encounter during the course of their work. However, many others who regularly travel rural roads can also be enlisted in this reporting effort.

Detailed Recommendations

Counties Should Adopt County Subdivision Ordinances

In order to afford the appropriate legal status to the necessary rigorous review of subdivision plats, each county should have and enforce a subdivision ordinance. Such an ordinance should be written to permit a county to provide meaningful input to the review process for plats of subdivisions located within two miles of cities with subdivision ordinances. It should also cover subdivisions more distant from cities. The requirements to which the developer will be held should be set forth prior to the time that a plat is submitted for review and approval. For example, the following provisions, among others, should be included for subdivisions outside of the two-mile distance from cities:

1. Storm water discharge should be checked for a major storm to assure that impounded water does not flood buildings within the area to be developed or cause flooding of sensitive areas outside of the subdivision boundaries.
2. Sidewalks on public right of way should not normally be required, but may be necessary to provide pedestrian safety for travel to major pedestrian traffic generators or to provide access to certain schools as provided in Section 320.1, Code of Iowa.

Guidance for developing a suitable ordinance is afforded by "A Model Subdivision Ordinance for Counties," included in Reference 2. A sample of subdivision street specifications, to be issued as a supplement to a subdivision ordinance, is included in Appendix E.

A Reasonable Policy Concerning Sidewalks Should be Adopted

A county, by deliberate decision, should define its goals in respect to sidewalks in rural subdivisions and unincorporated communities. Following agreement upon acceptable goals, a county should provide the necessary legal framework, develop a sidewalk inspection program that is consistent with those goals, and establish a program to carry out the necessary construction and repair. Suitable goals might fall anywhere within a range of possibilities from completely ignoring sidewalks at one extreme to the other extreme of a rigorous set of standards and vigorous enforcement to cause the correction of defects. Any position within this range is acceptable if it represents a thoughtful assessment of the safety needs of residents of the area and the degree of risk involved in each possible response. What is not acceptable is a resolution or ordinance

that expresses the intention to set extremely high standards for sidewalk maintenance but is followed by a lack of enforcement.

Counties Should Establish and Implement a System for Setting Road Maintenance Priorities

Highway funds are not likely to be available to any county in an amount sufficient to satisfy all of the demands for maintenance of a secondary road system. Public roads in rural subdivisions should receive priority to the extent that is consistent with the overall goal of providing a maximum possible level of safety and service to the system as a whole. This suggests the necessity of developing a systematic approach to the establishment of maintenance priorities.

Prescribing a maintenance management system is beyond the scope of this research. However, Reference 3 suggests a system for establishing maintenance priorities that is suitable for use in rural subdivisions and unincorporated communities.

Counties Should Establish and Implement a Procedure for Controlling Construction or Maintenance Activities Within the Highway Right of Way

County governments should exercise control as provided by statute on work within the highway right of way in rural subdivisions or unincorporated communities. The person carrying out such work should be required to receive a permit (see Appendix D for a sample permit form). The permit holder should certify that traffic control will be in accordance with provisions of the Manual on Uniform Traffic Control Devices and supplemental guidelines provided for this purpose such as those in Reference 4. Where excavation is involved in such work, county forces should inspect and approve backfill and resurfacing or reseeding or

resodding, as needed. A resolution effectuating specific regulations concerning permits should be enacted by each County Board of Supervisors. Counties may also require that a person working in the highway right of way furnish a bond that holds the county harmless in the event of an accident.

Counties Should Establish and Implement a System to Record Complaints that Are Received Relating to Highway Maintenance and to Assure Timely Correction of Defective Conditions Leading to Such Complaints

It is essential that a written record be retained of all complaints relating to defective conditions that are reported to county governments. Although such complaints may be directed to several different county offices, they should be consolidated in the office having the primary responsibility for corrective action. Highway-related complaints should be filed and retained in the office of the County Engineer. A suitable file would permit retrieval of complaints relating to a specific location, probably by section and township. The form for recording complaints should also include space for indicating that each complaint has been investigated and that corrective action has been taken where required. An example of such a form is included in Appendix D.

Counties Should Establish and Implement a Procedure to Ensure Timely Advice of Highway Defects for which Notice is Not Otherwise Received

Each county road department should solicit assistance from its employees, other public employees, and selected members of the general public to assure that defective highway conditions are promptly reported to the responsible official. Road maintenance employees in particular should be charged with the responsibility to report potentially hazardous

conditions they encounter in their work. The nature of this report should be active rather than passive, a direct contact with the Superintendent or County Engineer rather than a casual entry in a work log. Sheriff's Department officers and persons making regular deliveries in rural areas such as mail carriers, school bus drivers, fuel delivery drivers, and others should be requested to report unusual conditions of which they become aware. Prompt action is required to follow up on such reports so that the persons making the reports realize that the procedure is important and that their assistance is appreciated.

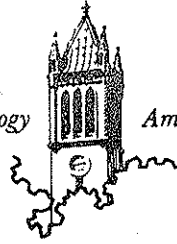
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APPENDICES

APPENDIX A
QUESTIONNAIRE FORM

Iowa State University *of Science and Technology* Ames, Iowa 50010



Engineering Research Institute
College of Engineering
104 Marston Hall
Telephone: 515-294-2336
September 23, 1980

Dear Sir:

The Iowa Department of Transportation is sponsoring a research project "More Effective Construction and Maintenance Practices to Minimize the Potential Liability of Municipalities for Street-Related Tort Claims". The Engineering Research Institute at Iowa State University has been charged with carrying out the research.

This project was developed in response to expressions of concern by municipal officials over the apparently sharp increase in the number of tort claims being submitted against municipalities. Objectives of the research include a quantification of such claims, an identification of the principal problem areas, and the formulation of recommendations to help alleviate the problem. Questionnaires are being sent to cities throughout Iowa with the expectation that the responses will provide information relating to each of these objectives.

You are requested to complete the enclosed questionnaire and return it to us. Additionally, we would appreciate receiving copies of any written procedures, inspection forms, or legal documents that would help us to better understand your experience with street-related tort claims. If you have developed an ordinance that you feel has been especially effective in reducing the occurrence of such claims, a copy of it would be helpful to us.

We recognize the burden imposed upon you in searching out the information requested. Some guidelines are attached to help you in identifying the types of claims that we are seeking. If your city is insured, you may find that help from your insurance carrier will be necessary in order to obtain this information.

Your response is essential if we are to be able to carry out this research, the goal of which is to reduce the future liability of your city. Please call me at (515) 294-6777 if you have any questions.

Sincerely yours,

R. L. Carstens
Professor of Civil Engineering

RLC/dlb
enclosures

Guidelines for Identifying Relevant Tort Claims

The claims that are of concern to us are those that result from alleged defects or inadequacies in the design, construction, or maintenance of streets, sidewalks, alleys, or related publicly owned utilities. Include claims against the city relating to street appurtenances and their operation to include traffic signs and signals, storm sewers, sanitary sewers, and water distribution lines within a public right of way as well as temporary signs, barricades, or other devices used during street construction or maintenance activities.

Please do not include the following:

- Workers compensation claims.
- A claim lodged against a city only because it is the owner of an electric utility.
- A claim lodged against a city only because it is a public transit operator.
- A claim resulting from a motor vehicle accident that is of such nature that it would have been handled by the auto insurance carrier if the vehicle had been owned by a private individual.
- A claim resulting from the public safety responsibilities of a city wherein the cause for the claim was an action by a law enforcement officer rather than a defect in a street facility.
- Claims that result from flooding of drainage channels or conduits that are located outside of street rights of way.
- Any claim relating to off-street parking facilities.

1. Tort claims filed during the period July 1, 1975 to June 30, 1976.

Problem area	Number of claims	Total amount claimed, \$	Claims paid Number	Amount, \$	Claims pending 6-30-80 Number	Amount, \$
Street defects	_____	_____	_____	_____	_____	_____
Sidewalk defects	_____	_____	_____	_____	_____	_____
Storm water flooding	_____	_____	_____	_____	_____	_____
Sanitary sewer backup	_____	_____	_____	_____	_____	_____
Traffic signs, signals, markings, etc.	_____	_____	_____	_____	_____	_____
Traffic control during street maintenance	_____	_____	_____	_____	_____	_____
Failure to remove ice or snow	_____	_____	_____	_____	_____	_____
Railroad crossing problems	_____	_____	_____	_____	_____	_____
Water service problems	_____	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

2. Tort claims filed during the period July 1, 1976 to June 30, 1977.

Problem area	Number of claims	Total amount claimed, \$	Claims paid		Claims pending 6-30-80	
			Number	Amount, \$	Number	Amount, \$
Street defects	_____	_____	_____	_____	_____	_____
Sidewalk defects	_____	_____	_____	_____	_____	_____
Storm water flooding	_____	_____	_____	_____	_____	_____
Sanitary sewer backup	_____	_____	_____	_____	_____	_____
Traffic signs, signals, markings, etc.	_____	_____	_____	_____	_____	_____
Traffic control during street maintenance	_____	_____	_____	_____	_____	_____
Failure to remove ice or snow	_____	_____	_____	_____	_____	_____
Railroad crossing problems	_____	_____	_____	_____	_____	_____
Water service problems	_____	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

3. Tort claims filed during the period July 1, 1977 to June 30, 1978.

Problem area	Number of claims	Total amount claimed, \$	Claims paid Number	Amount, \$	Claims pending 6-30-80 Number	Amount, \$
Street defects	_____	_____	_____	_____	_____	_____
Sidewalk defects	_____	_____	_____	_____	_____	_____
Storm water flooding	_____	_____	_____	_____	_____	_____
Sanitary sewer backup	_____	_____	_____	_____	_____	_____
Traffic signs, signals, markings, etc.	_____	_____	_____	_____	_____	_____
Traffic control during street maintenance	_____	_____	_____	_____	_____	_____
Failure to remove ice or snow	_____	_____	_____	_____	_____	_____
Railroad crossing problems	_____	_____	_____	_____	_____	_____
Water service problems	_____	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

4. Tort claims filed during the period July 1, 1978 to June 30, 1979.

Problem area	Number of claims	Total amount claimed, \$	Claims paid		Claims pending 6-30-80	
			Number	Amount, \$	Number	Amount, \$
Street defects	_____	_____	_____	_____	_____	_____
Sidewalk defects	_____	_____	_____	_____	_____	_____
Storm water flooding	_____	_____	_____	_____	_____	_____
Sanitary sewer backup	_____	_____	_____	_____	_____	_____
Traffic signs, signals, markings, etc.	_____	_____	_____	_____	_____	_____
Traffic control during street maintenance	_____	_____	_____	_____	_____	_____
Failure to remove ice or snow	_____	_____	_____	_____	_____	_____
Railroad crossing problems	_____	_____	_____	_____	_____	_____
Water service problems	_____	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

5. Tort claims filed during the period July 1, 1979 to June 30, 1980.

Problem area	Number of claims	Total amount claimed, \$	Claims paid Number	Amount, \$	Claims pending 6-30-80 Number	Amount, \$
Street defects	_____	_____	_____	_____	_____	_____
Sidewalk defects	_____	_____	_____	_____	_____	_____
Storm water flooding	_____	_____	_____	_____	_____	_____
Sanitary sewer backup	_____	_____	_____	_____	_____	_____
Traffic signs, signals, markings, etc.	_____	_____	_____	_____	_____	_____
Traffic control during street maintenance	_____	_____	_____	_____	_____	_____
Failure to remove ice or snow	_____	_____	_____	_____	_____	_____
Railroad crossing problems	_____	_____	_____	_____	_____	_____
Water service problems	_____	_____	_____	_____	_____	_____
Other (specify) _____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
Total	_____	_____	_____	_____	_____	_____

7. Do you have a city employee specifically responsible for processing and follow-up on street related tort claims?

Yes _____ No _____

If answer is yes, what is title of position? _____

8. Do you have a city employee specifically assigned to seek out, detect, and report street and sidewalk defects?

Yes _____ No _____

If answer is yes, what is title of position? _____

9. Do you have and regularly enforce an ordinance assigning responsibility for maintaining public sidewalks in a suitable state of repair?

Yes _____ No _____

If answer is yes to either question 8 or 9, copies of supporting documents (inspection forms, ordinance, or other) would be appreciated.

10. Do you have an ordinance requiring sidewalks within the street right of way in new subdivisions?

Yes _____ No _____

11. Comments.

12. Questionnaire completed by:

Name

Title

Address

Return completed questionnaire to:

R. L. Carstens
Department of Civil Engineering
Iowa State University
Ames, Iowa 50011

APPENDIX B
ADDITIONAL SURVEY RESPONSES

ADDITIONAL SURVEY RESPONSES

Question 6 concerning street-related tort claims that resulted in lawsuits

156 lawsuits were reported; 147 were quantified, in a total amount of \$15,311,764

85 suits had been settled by June 30, 1980; 84 settlements were quantified, in a total amount of \$505,031

51 were settled out of court

27 were resolved by a judgment of a court

7 were not indicated as to the manner of settlement

71 suits had not been settled as of June 30, 1980

Problem areas reportedly leading to these suits were as follows:

- 38 Sidewalk defects
- 31 Street defects
- 28 Failure to remove ice or snow
- 18 Traffic signs, signals, markings, etc.
- 15 Sanitary sewer backup
- 10 Railroad crossing problems
- 6 Traffic control during street maintenance
- 6 Water service problems
- 3 Storm water flooding
- 1 Other (gas line explosion)

The fiscal year in which the claim was filed was reported as follows:

15 in 1976

21 in 1977

27 in 1978

31 in 1979

60 in 1980

Question 7 concerning a follow-up on street-related tort claims

47 cities answered Yes

105 cities answered No

12 cities did not respond to this question

There was no consistent pattern by city size in the nature of this response except that all cities with populations over 50,000 responded Yes.

The title of the person performing this function was reported as follows:

12 City Clerk

7 Director of Public Works

7 City Administrator (5) or City Manager (2)

7 City Attorney (6) or Assistant City Attorney (1)

1 or 2 each for a variety of titles including Street Commissioner (2), Mayor (1), and Claims Investigator (2)

Question 8 concerning inspection and reporting of sidewalk defects

53 cities answered Yes

100 cities answered No

11 cities did not respond to this question

Fewer than one-third of cities with populations under 5,000 answered Yes to this question, nearly half of the cities with populations 5,000 to 50,000 and 4 out of 5 with populations over 50,000 answered Yes.

The title of the person performing this function was reported as follows:

- 19 Street Superintendent (or similar title)
- 14 Public Works Director (or similar title)
- 4 Building Inspector
- 4 Sidewalk Inspector

Up to 3 each for a variety of titles including Street Commissioner (3), Council Committee (1), and Police (1)

Question 9 concerning regular enforcement of an ordinance covering sidewalk repair

58 cities answered Yes

90 cities answered No

16 cities did not respond to this question

Most cities with populations under 5,000 answered No, most cities with populations over 5,000, including all 5 cities with over 50,000 population, answered Yes.

Question 10 concerning a requirement for sidewalks in new subdivisions

58 cities answered Yes

93 cities answered No

13 cities did not respond to this question

Most cities with populations under 5,000 answered No, most cities with populations over 5,000, including all 5 cities with over 50,000 population, answered Yes.

Question 11

Several respondents made comments in response to question 11, largely in further explanation of answers given previously.

Several cities enclosed all or portions of their sidewalk ordinance. Only two included definitive standards for assessing sidewalk defects. The others generally were patterned after one or the other of two model sidewalk ordinances. One city's ordinance gave rather precise dimensions for the wood planks to be used for constructing sidewalks.

APPENDIX C

SAMPLE SIDEWALK ORDINANCE

Source: City of Sioux City

SIDEWALKS 17.20.010-17.20.020

Chapter 17.20

SIDEWALKS

Sections:

- 17.20.010 Definitions.
- 17.20.020 Sidewalk specifications.
- 17.20.030 Permit to construct sidewalk.
- 17.20.040 Inspection of sidewalk.
- 17.20.050 Barricades and signal lights.
- 17.20.060 Interference with sidewalk improvements.
- 17.20.070 Repairing defective sidewalks.
- 17.20.080 Failure to repair or barricade.
- 17.20.090 Notice of assessment of repair costs.
- 17.20.100 Hearing and assessment.
- 17.20.110 Billing and certifying to county.
- 17.20.120 Liability of abutting owners.
- 17.20.130 Penalty.

17.20.010 Definitions. As used in this chapter, the following words have the following meanings:

(1) "Defective sidewalk" means any public sidewalk exhibiting one or more of the following characteristics:

- (A) Vertical separations equal to three-fourths inch or more;
- (B) Horizontal separations equal to three-fourths inch or more;
- (C) Holes or depressions equal to three-fourths inch or more;
- (D) Spalling over fifty percent of a single square or panel of the sidewalk with one or more depressions equal to one-half inch or more;
- (E) A single square or panel of sidewalk cracked in such a manner that no part thereof has a piece greater than one square foot or is cracked in such a manner that it constitutes a danger or a potential danger to the public;
- (F) A sidewalk with any part thereof missing to the full depth;
- (G) A deviation on the staked and constructed grade equal to three-fourths inch or more.

(2) "Sidewalk improvements" means the construction, reconstruction, repair, replacement or removal of a public sidewalk and/or the excavating, filling or depositing of material in public right-of-way in connection therewith.

(3) "Owner" means the person owning the fee title and the contract purchaser for purposes of any notification required herein. For all other purposes, "owner" shall include the lessee, if any. (Ord. S-30306 § 1 (part), 1976).

17.20.020 Sidewalk specifications. All sidewalk improvements in public property, whether performed by the owner of the abutting property or by the city, shall be performed under the supervision and inspection of the city engineer and in accordance with the plans and specifications prepared by his

17.20.030-17.20.040 STREETS AND SIDEWALKS

office and approved by the city council. No permanent sidewalk improvements shall be performed until the bed for the same shall have been graded so that when completed such sidewalk will be at the location and grade established by the city engineer. (Ord. S-30306 § 1 (part), 1976).

17.20.030 Permit to construct sidewalk. (a) No person shall make any sidewalk improvements whether ordered by the city council or not, unless such person shall obtain a permit from the city engineer and agree in writing that he will, in making the sidewalk improvements, comply with the ordinances of the city and with the specifications for sidewalks as prepared by the engineering department and approved by the city council, and that the work shall be done under the direction and supervision of the city engineer and subject to the approval of the city engineer or his duly authorized agent. He shall file a bond in the proper amount and shall also agree to hold the city free from all liability for damages on account of injuries received by anyone through the negligence of such person or his agents or servants in making the sidewalk improvements, or by reason of such person's failure to properly guard the premises. All such permits shall be issued without charge and a copy thereof, together with the written agreement above referred to, shall be filed and preserved in the office of the city engineer. Before granting any permit to make sidewalk improvements, the city engineer shall determine the propriety of the same and shall state in all permits issued when the work is to be commenced, if not upon issuance of the permit, and when the sidewalk work is to be completed. The time of completion for the sidewalk improvements may be extended by the city engineer when in his judgment the same is deemed necessary. All permits for the sidewalk improvements shall be issued in compliance with the resolution of the city council ordering the same. All permits for sidewalk improvements not ordered by resolution of the city council shall be issued in compliance with this chapter. The city engineer may withhold the issuance of any permit for any sidewalk improvements for a sufficient period to determine the necessity for the proposed improvements or when weather conditions will adversely affect the sidewalk improvements.

(b) All sidewalk improvements in areas where areaways exist or are proposed and in areas specially designated by the city engineer shall include the construction, reconstruction or repair of the abutting curb, in accordance with plans and/or specifications on file in the city engineering department. (Ord. S-30306 § 1 (part), 1976).

17.20.040 Inspection of sidewalks. All sidewalk improvements shall be done under the direction and supervision of the city engineer or his duly authorized agent, and subject to the inspection and approval of the engineer or his agent. Whenever any sidewalk improvements are made which do not conform to the provisions of this chapter and with the specifications herein referred to, or where any sidewalk improvements are made without obtaining a permit therefor as in this chapter provided, or the work is not

SIDEWALKS 17.20.050-17.20.070

performed within the time provided for and stated in the permit obtained, the city engineer, or his duly authorized agent, may serve upon the property owner or his agent, and upon the contractor or party interested and doing the work, a written notice to obtain a permit therefor, if not already obtained, or, if the sidewalk is in the course of construction, to stop the work, and if the sidewalk work has been completed, to obtain a permit therefor, perform necessary sidewalk improvements within five days from the receipt of said notice as the case may be, in the proper manner and of proper materials as required by this chapter and specifications herein referred to, and in case they, or any one of them, shall fail to do so, the city engineer or his duly authorized agent may cause the sidewalk to be removed, constructed, reconstructed or repaired in a proper manner and of proper materials, and the cost thereof shall be assessed to the property fronting thereon. There shall be returned to the council an itemized and verified statement of expenditures of material and of the labor used in doing such work, and the legal description of the lot, part of lot, or parcel of ground abutting the sidewalk on which such work has been performed. (Ord. S-30306 § 1 (part), 1976).

17.20.050 Barricades and signal lights. Whenever any material of any kind shall be deposited on any street, avenue, highway, passageway or alley when sidewalk improvements are being made or when any sidewalk is in a dangerous condition, it shall be the duty of all persons having an interest therein, either as owner, agent, contractor, or as owner or lessee of the property in front of or along which such material may be deposited, or such dangerous condition exists, to put in conspicuous places at each end of such sidewalk and at each end of any pile of material deposited in the street, a sufficient number of approved signal lights, and to keep them burning during the entire night and to erect sufficient barricades both at night and in the daytime to secure the same. The party or parties using the street for any of the purposes specified in this chapter shall be liable for all injuries or damage to persons or property arising from any wrongful act or negligence of the party or parties, or their agents or employees or for any misuse of the privileges conferred by this chapter or of any failure to comply with the provisions hereof (Ord. S-30306 § 1 (part), 1976).

17.20.060 Interference with sidewalk improvements. No person shall knowingly or wilfully drive any vehicle upon any portion of any sidewalk or approach thereto while said sidewalk or approach is in the process of being improved or upon any portion of any completed sidewalk or approach thereto, or shall remove or destroy any part or all of any sidewalk or approach thereto, or shall remove, destroy, mar or deface any sidewalk at any time or destroy, mar, remove or deface any notice provided by this chapter. (Ord. S-30306 § 1 (part), 1976).

17.20.070 Repairing defective sidewalks. It shall be the duty of the

17.20.080-17.20.110 STREETS AND SIDEWALKS

abutting property owner at all times to repair, replace or reconstruct, or cause to be repaired, replaced or reconstructed, all broken or defective public sidewalks in the street right-of-way abutting his property. At such time as knowledge of broken or defective public sidewalks in the street right-of-way is brought to the attention of the city engineer, he may issue a written notice to the abutting property owner ordering him to repair, replace or reconstruct said sidewalks, or cause them to be repaired, replaced or reconstructed within thirty days from the receipt of the notice. If, upon the expiration of thirty days as provided in said notice, required work has not been done or is not in the process of completion, the city engineer may cause the same to be repaired, replaced or reconstructed and the cost thereof shall be assessed to the property fronting thereon. There shall be returned to the council an itemized and verified statement of expenditures of material and of the labor used in doing such work, and the legal description of the lot, part of lot, or parcel of ground abutting the sidewalk on which such work has been performed. (Ord. S-30306 § 1 (part), 1976).

17.20.080 Failure to repair or barricade. It shall be the duty of the owner, or their contractor or agent, to notify the city immediately in the event they fail or are unable to make necessary sidewalk improvements or to install or erect necessary barricades as required by this chapter. (Ord. S-30306 § 1 (part), 1976).

17.20.090 Notice of assessment of repair costs. Upon the filing of a verified statement with the city clerk, the clerk shall cause a written notice of such facts to be given to the owner of the lots or parcels of ground abutting the sidewalk repaired, replaced, or reconstructed, either by personal service or by certified mail addressed to the last known address of the person liable for such expense. The notice shall contain a statement of the character of the work performed; a description of the property affected; the amount returned against such lot or parcel of ground; and that the person may pay the amount assessed by a certain date without interest or penalty. The notice shall also indicate that the persons notified may object to such assessment and the notice shall state the place and time at which council will hear such objections. The time set for hearing shall be not less than ten days after the service or mailing of said notice. (Ord. S-30306 § 1 (part), 1976).

17.20.100 Hearing and assessment. At the time and place designated in such notice, the council shall meet, hear and consider all objections to the whole or any part of such assessment, and shall correct all errors or omissions therein, and after such consideration, the council shall adopt corrected list as the amounts to be assessed against the property therein described. (Ord. S-30306 § 1 (part), 1976).

17.20.110 Billing and certifying to county. If, after the adoption by the council of the final assessment against each lot, part of lot, or parcel of land,

SIDEWALKS 17.20.120-17.20.130

any assessment or any part thereof shall remain unpaid for over thirty days after council determination of correct charges, the clerk shall certify to the county auditor as a special tax against the lot, part of lot, or parcel of ground all unpaid amounts, which shall be collected by the county treasurer in the same manner as all other taxes. Any assessment which exceeds one hundred dollars may be paid in annual installments as set by council, not exceeding ten, in the same manner and at the same interest rates as for special assessments under the Code of Iowa. No interest shall be charged for assessments, or part thereof, paid within thirty days of the time that council determined the final amounts. (Ord. S-30306 § 1 (part), 1976).

17.20.120 Liability of abutting owners. In the event the owner of property abutting any public sidewalk fails or refuses to perform any act required of him by this chapter and in the event an action is brought against the city for personal injuries alleged to have been caused by a defect in or the condition of said sidewalk, the city may notify in writing the said abutting owner that it claims the injury was caused by his negligence and/or his failure to repair the defect or eliminate the condition complained of. The notice shall state the pendency of the action, the name of the plaintiff, the name and location of the court where the action is pending, a brief statement of the alleged facts from which the cause arose, that the city believes that the person notified is liable to it for any judgment rendered against the city, and asking the person to appear and defend. A judgment obtained in the suit is conclusive in any action by the city against any person so notified, as to the existence of the defect or condition or other cause of the injury or damage, as to the liability of the city to the plaintiff in the first-named action, and as to the amount of the damage or injury. The city may maintain an action against the person notified to recover the amount of the judgment together with all the expenses incurred by the city in the suit. (Ord. S-30306 § 1 (part), 1976).

17.20.130 Penalty. Anyone violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor and, upon conviction be subject to imprisonment not exceeding thirty days, or a fine not exceeding one hundred dollars. (Ord. S-30306 § 1 (part), 1976).

APPENDIX D

SAMPLE FORMS

COMPLAINT RECORD	
PROJECT _____	W.O. NO. _____
LOCATION _____	
REQUESTED BY _____	
ADDRESS _____	PHONE _____
NATURE OF REQUEST _____	

RECEIVED BY _____	DATE _____
REFERRED TO _____	DATE _____
REPORT: _____	

DISPOSITION _____	
WHEN INVESTIGATION IS COMPLETED, RETURN YELLOW COPY TO OFFICE	

Source: City of Des Moines, Iowa. Public Improvement
Design Standards Manual, 1977.

PERMIT FOR MAKING OPENING IN PAVED STREET

Nº 16833 -W

PUBLIC SERVICE
DEPARTMENT

Sioux City, Iowa, _____, 19_____

_____ having complied with the Ordinances
providing for the making of Sewer, Gas and Water connections, permission is hereby given
to make an opening on the _____ side of _____ Street
_____ feet _____ from the _____ line of _____ Street
under conditions of said Ordinances for the purpose of making _____

For _____, Owner

House No. _____

Public Service Director

Source: City of Sioux City

SAMPLE MAINTENANCE WORK ORDER

CLINTON COUNTY
MAINTENANCE WORK ORDER

Date _____ Work Order No. _____
 Time _____ Foreman _____
 Reported by _____ Location _____ side _____
 Address _____ Section _____
 Telephone _____ Twp. _____
 Range _____

Description of Work requested _____

Signature

Description of Work done _____

Signature

Date work completed _____
 White Copy-Field
 Yellow Copy-Office

Source: Clinton County

NOTICE TO REPAIR SIDEWALK

To _____

YOU ARE HEREBY NOTIFIED THAT the City of Des Moines, Iowa, requires that you repair the sidewalk in front of _____

for the reason that same is in defective condition.

YOU ARE FURTHER NOTIFIED that unless you repair or replace said sidewalk within _____ days, so same shall be in proper and safe condition, the City of Des Moines will make the necessary repairs or replacement, and assess the cost and expense thereof to you, which expense shall be certified and collected as taxes, pursuant to Ordinance No. 7944, City of Des Moines, Iowa.

To all of which take due notice and govern yourself accordingly.

Dated this _____ day of _____ at Des Moines, Iowa.

Leo L. Johnson, Director
Department of Public Works
City of Des Moines, Iowa

By _____

SERVICE REQUEST

The City Of
DUBUQUE
Engineering Division

FILE NUMBER

Requested By: _____

Referred To: _____

By: _____

Date: _____

☐ Traffic Signals☐ Traffic Signs☐ Traffic Marking☐ Parking Meters☐ Barricades

LOCATION:

TRAFFIC WORK ORDER:

Action Taken: _____

Date Completed: _____

Time Completed _____

By: _____

Source: City of Dubuque

PUBLIC WORKS DEPARTMENT
SEWER MAINTENANCE REPORT

This form is to be completed each time sewer work
is performed & submitted to the P.W. Dept.

Call/Maintenance Date _____ 19____ Time _____

Name of Supervisor _____

- 1) Street section
(location) _____
- 2) Line section
(MH# to MH#) _____
- 3) Reason for call
or maintenance _____
- 4) Process (ball,
jet, rod, etc.) _____

RELATED DAMAGE REPORT

- A) Property Address _____
- B) Owner/Occupant Name _____
- C) Phone Number _____
- D) Damage description
(property, articles,
etc.) _____
- E) Cause of damage;
line block, etc.,
private backup,
corrective action. _____
- F) Responsibility for
damage (city,
private, etc.) _____
- G) Action taken
(on site inspection,
claim filed, etc.) _____
- H) Additional informa-
tion (plumber called,
etc.)
Comments _____

APPENDIX E

SAMPLE SUBDIVISION STREETS SPECIFICATION

Source: Story County

SUBDIVISION STREETS SPECIFICATIONS

- A. These specifications cover all streets serving 5 or more lots. All construction must be done in accord with current Iowa DOT Standard Specifications unless otherwise approved prior to construction.

1. Rights-of-way

- a. Rural cross-section - minimum 50 feet. The right-of-way must be wide enough to accommodate the entire roadway (pavement, shoulders, foreslopes, backslopes and ditches) as well as any utilities and sidewalks which are to be on the dedicated lands. (Subdivision Ordinance Article 11-C)
- b. Cul-de-sac - Circular shall have minimum 50 foot radius. Other shapes shall have adequate right-of-way to allow full and free use of the facility. (Subdivision Ordinance Article 11-C)
- c. Corner Lots - There shall be a minimum 25 foot radius on lot corners at intersecting streets. (See Subdivision Ordinance Article 11-E-5)
- d. County Roads - A minimum of 60 feet of right-of-way from centerline of existing roads shall be deeded to the County for potential future improvements. If more right-of-way is required it will be noted at time of preliminary plat review.
- e. Building Set Back - As defined in the appropriate section of the Zoning Ordinance.

2. General Design Guides

a. Cross-Section and Alignment

- Paved roadway - 22 feet wide
- Shoulders - 4 feet wide
- Foreslopes - 3:1
- Ditch - 2 feet deep, 6 feet wide
- Backslopes - 3:1
- Pavement Crown - 1.5% to 2.5%
- Pavement Thickness:
 - Portland Cement Concrete - 6 inches
 - Asphalt Cement Concrete - 4½ inches of Base and 1½ inches of wearing course
- Horizontal Curvature - 200 foot radius from centerline tangent alignment.
- Curb & Gutter Units - Constructed on each side of roadway pavement at a width of 31 feet from back to back of curb.
- Vertical Curvature - Maximum 9% grades and minimum 300 foot curves.

3. Grading

Suitable material excavated from the ditch area shall be used to raise the roadbed above the surrounding lands. All unstable areas in the grade shall be removed and replaced with suitable material. The top shall be finished to an adequate width to accommodate the future paving and shall be crowned at least 1/4 inch per foot from shoulder line to centerline.

When a subdivision street connects with a county road, it shall slope away from the county road at a minimum grade of 1% for at least 10 feet from the shoulder line. All material placed in the roadway shall be uniformly and properly compacted with equipment designed for the work.

4. Drainage Requirements

Where curb and gutter is not provided, all surface drainage shall be carried in ditches through adequate culverts and turned off the roadway at natural waterway outlets. All culverts used shall be new and properly sized with a minimum diameter of 15 inches. If natural outlets are not available, drain tile of adequate size shall be installed to remove the surface water.

Where curb and gutter is used, a storm drain system of adequate size shall be constructed to drain all surface water to a natural outlet.

5. Plans

Detail plans shall be drawn under the direct supervision of the registered Engineer for the subdivider and shall be properly certified.

The plans shall include all construction features of the proposed project. The plans shall be submitted to the County Board of Supervisors and Engineer for their approval. No work shall be started on the street system until the plans are approved.

At the time of plan submission the developer must submit a copy of all calculations used in determining the size of drainage structures and the estimated cost of the work.

6. Specifications

All construction work and materials incorporated into an approved project shall meet all requirements of the current Standard Specifications for Highway and Bridge Construction, Iowa Department of Transportation, and supplements thereto.

7. Inspection

The developer shall retain a Professional Engineer to provide construction staking and inspection. At the completion of the work the Engineer shall certify the work to the County Engineer. The certification shall be that all work was accomplished in accord with the approved plans and specifications.

The County Engineer or his authorized representative may make periodic inspections of the work in progress. After each phase of the work has been certified complete, he shall notify the developer of the need for any further work or approve the work with concurrence of the Board of Supervisors.

B. Streets serving 4 or less lots (See Subdivision Ordinance Article 11-C-6)

These streets should be constructed in the same general manner as previously described herein.

The minimum finished roadway top should be 28 feet, of which 20 feet should be surfaced with all weather surfacing material.

Plans and profile information shall be submitted along with the plans described in Item A5, for the first 100 feet adjacent to the streets serving 5 or more lots.

All materials used should be new and comply with the requirements of Item A6.

*Approved by Board of Supervisors
December 28, 1978.*