

1990 PLANNING and RESEARCH PROGRAM

S U M M A R Y

HPR-PR

Expenditures & Accomplishments

September, 1990



**Iowa Department
of Transportation**

IOWA DEPARTMENT OF TRANSPORTATION
 PLANNING AND RESEARCH PROGRAM
 July 1, 1989 - July 1, 1990

S U M M A R Y O F H P R - P R E X P E N D I T U R E S

Program Section	Program Estimate	Actual Expend.	Ratio

PART I. PLANNING			
1. Administration	N.A.	N.A.	
2. Highway Inventory	\$228,500	\$237,557	1.04
3. Cartography	\$335,400	\$404,326	1.21 *
4. Highway Traffic	\$1,245,000	\$1,146,364	0.92
5. Highway Statistics	\$300,500	\$343,383	1.14 **
6. Economic & Fiscal	\$811,200	\$762,064	0.94
7. Systems & Programming	\$831,700	\$805,609	0.97
8. Urban Transportation	\$160,000	\$181,856	1.14 ***
9. Speed Studies	\$7,500	\$1,926	0.26 ****
PART II. RESEARCH			
Transport. Research	\$211,030	\$141,008	0.67 *****

PART I & II TOTAL	\$4,130,830	\$4,024,093	0.97

Notes on over/underruns:

- * CADD night shift not included in program estimate.
- ** Wage rates for expended hours were higher than estimate.
- *** More hours required than anticipated in program estimate.
- **** Fewer equipment malfunctions than anticipated in estimate.
- ***** Trans. Research Board dues paid from a Non-HPR work function.

A completed budget status and accomplishment report have been added to the original program objectives and proposed work statements on the following pages.

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING AND RESEARCH PROGRAM
PART 1. PLANNING

2. HIGHWAY INVENTORY

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OBJECTIVE AND PROPOSED WORK - July 1, 1989/June 30, 1990

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The objective is to maintain a current Base Record Inventory of highway facilities, an inventory of defense highway bridges, and inventory of railroad grade crossings.

Municipal street inventory will be conducted in 30 counties. Secondary road inventory will be completed in ten counties. Field crews will also inventory 430 miles of roads in State Parks and Institutions. The Structure Inventory and Appraisal tape will be updated and submitted to FHWA in November, 1989 and May, 1990.

Work on the Data Base Management System will be continued during the year. It will include road, structure, section description, railroad crossing, and accident files.

Videologging will include recording approximately 8,000 lane miles of primary highways and 50 lane miles of detour and haul roads. Videologging disc costs will be included as an HPR Function 728 item.

Railroad crossing files will continue to be maintained and updated.

Coordination of data processing requests will also be an ongoing process during this period.

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BUDGET STATUS

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(cost center/function	Program Hours	Program Dollars	Actual Hours	Actual Dollars
A. RURAL AND URBAN (2210/728)	13,440	187,500	14,698	200,397
B. BRIDGE DATA (2210/749)	180	3,100	0	0
C. RAIL GRADE CROSSINGS (2210/703)	660	10,200	613	10,017
D. BASE RECORDS (2210/757)	1,940	27,700	1,290	27,143

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ACCOMPLISHMENTS - FY 89-90

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Field inventory was completed on 4400 miles of municipal streets in 30 counties and on 1400 miles of Secondary roads in 10 counties. DOT crews also inventoried 476 miles of roads in state parks and institutions. The Structure Inventory and Appraisal (SI & A) tape was updated and submitted to FHWA in November, 1989 and May, 1990. The bridge data project (Function 749) was absorbed in the new SI & A reporting system and no expenditures were incurred in function 749.

The Data Base Management System project progressed on schedule during the year. Fewer hours and a higher hourly rate caused the underrun on Program Hours (1940 vs. 1290 actual) and 98 per cent expenditure of the Program Dollars.

Videologging and indexing of 4000 miles of Interstate and Commercial Network highways was completed. Operations were halted in late August when the van and equipment were destroyed in an accident with another motor vehicle.

Railroad crossing files were maintained and updated during the year as changes were received.

Coordination of data processing requests was a continuing process during the year.

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PART 1. PLANNING

3. CARTOGRAPHY

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OBJECTIVE AND PROPOSED WORK - July 1, 1989/June 30, 1990

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The objective is to produce and maintain a current cartographic data base for maps of transportation systems and related information.

Cartographic activities will include the development and production of state, county, city, and special maps with the CADD system. Film, chemicals, and other photographic supplies used by the Cartographic Section will be included as HPR Function 706 items.

Work will continue on the CADD System development of a cartographic data base for map production. Function 705 will be used to record work on the CADD system in management of files, development of applications and production procedures. Staff training on the CADD system will also be continued.

Staff will continue to explore opportunities for development of a Geographic Information System. Work on a joint development proposal with another state agency will also continue.

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BUDGET STATUS

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(cost center/function	Program Hours	Program Dollars	Actual Hours	Actual Dollars
CADD System (2210/705)	5,230	94,700	3,526	64,645
Mapping and Graphics (2210/706	15,700	240,700	20,131	339,681

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ACCOMPLISHMENTS - FY 89-90

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Activity during the past year included the developing or updating for:

- State Highway Map
- Primary Road Surface Width and Vertical Clearance Map
- Interstate Highway Map Indicating Vertical Clearance
- Railroad Map
- Railroad Service Map
- Rail Company Abandonment Plans Map
- Highway and Transportation County Map (first time using CADD)
- Highway and Street Map
- Federal Urban System Maps
- Control Section Record Maps

Special maps and graphics were prepared for:

- DOT property annexations
- Monthly ATR update reports
- Railroad Freight Traffic Density Map
- Chronology of Iowa Railroad Abandonments
- Potential Rail Assistance Projects
- Iowa Publicly Owned Airports
- Funded Recreation Trails Projects
- Parks and Institutional Road System
- Approved Traffic Safety Applications
- Approved RISE Projects
- Work to be Accomplished in 1990
- Pavement Width 18' and 20' and Five-Year Program Status
- Program Status by Service Level and Sufficiency
- Commercial and Industrial Network
- Designated Truck Route System Map
- Percent of Paved Roads on the Farm to Market System

The Computer Aided Design and Drafting (CADD) system has been in operation for four years. Map specifications and production procedures are continuing to be developed for state, county, city, and special maps. User commands continue to be written to improve production efficiency. Special maps were prepared by interfacing the primary base record and CADD systems. ALAS nodes are being entered into a data file for interfacing with road base records. Specifications and procedures are being developed for producing the ALAS node maps.

Highway and Transportation County Maps showing surface type and the Federal Aid Urban System Maps were produced with the CADD system for the first time.

A demonstration project was initiated with the Department of Natural Resources and funded with a legislative appropriation from Iowa's oil overcharge fund. The primary objective of the project is to exchange data files between the DOT Intergraph System and the Environmental Systems Research Institute (ERSI) ARC/INFO System used by the Department of Natural Resources.

Function 705 was used for the third year to identify CADD development costs. The combined expenditures of functions 705 and 706 was 20 percent over the program estimate because the 4,431 hours of night shift employees were not included. The ability to estimate the split of costs between functions should improve as the technical development/production roles stabilize with more experience.

IOWA DEPARTMENT OF TRANSPORTATION
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PART 1. PLANNING

4. HIGHWAY TRAFFIC

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OBJECTIVE AND PROPOSED WORK - July 1, 1989/June 30, 1990

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The objectives are to measure motor vehicle volumes, weights, dimensions, and travel patterns and to provide traffic projections and analysis.

- A. VOLUME COUNTS - Traffic volume, velocity, and classification data will be collected using the 123 Automatic Traffic Recorder network. Monthly and annual reports will be prepared and distributed; computer tapes will be submitted to the FHWA.

Two new ATR stations will be installed for speed monitoring as a result of the speed limit change from 55 to 65 mph. These will be on the urban Interstate System.

Ten ATR stations will be upgraded to obtain vehicle type by the 13 Traffic Monitoring Guide classifications. This is an acceleration of the February 1989 Traffic Monitoring Plan to install six sites per year. Initial installation will be in central Iowa for convenient staff access. Three stations will be on the Rural Primary System, two on the Municipal Interstate System, and one on the Municipal Primary System. This is the first step of the plan to install vehicle classification equipment at 30 existing ATR locations.

locations. Loop failures are usually related to pavement deterioration, reconstruction, or maintenance operations.

The summer count program will include primary, secondary, and municipal roads and streets in the northeast 25 counties. Machine classification counts will replace the manual 24-hour control stations and the rural primary manual counts. Twenty-four hour

machine counts will be used instead of four-hour counts on the Secondary Road System.

Information will be gathered on motorcycle helmet usage, vehicle occupancy, and bicycle travel as part of the count program.

Screenline and cordonline counts are scheduled in the Dubuque, Cedar Rapids and Waterloo urbanized areas.

City and county traffic maps will be prepared and distributed.

- B. VEHICLE WEIGHT SURVEY - Assistance will continue with the installation and testing of the Automatic Weight and Classification (AWAC) stations to determine the feasibility of using piezo electric technology. Selection of future AWAC sites will include consideration of the Traffic Monitoring Guide recommendations.

It is planned to install AWAC equipment at four sites if budget and staffing permit. Tentative locations are:

1. Cedar County near Durant (ATR #108) - I-80
2. Benton County near Brandon (ATR #113) - I-380
3. Hamilton County near Webster City (ATR #247) - U.S. 20
4. Scott County near Eldridge (ATR #242) - U.S. 61

These locations were selected to complement the I-35 Story and I-80 Pottawattamie research sites and to provide geographic coverage on the Iowa Interstate System. The two Primary highway locations are typical rural highway sites with significant truck volumes.

If testing on AWACS is favorable, the 1991 truck weight program will involve both AWAC and conventional weigh operations. Data from this program will be analyzed and a report published. Computer tapes will be submitted to the FHWA in addition to the report.

- C. RURAL ORIGIN AND DESTINATION SURVEYS - Requests for historical data will be filled from microfilm records.

- D. FORECASTING - Over 270 requests for traffic forecasts, road-user benefit-cost and analyses, intersection turning movement studies, forecasts of equivalent single axle loads for pavement determinations or other traffic related studies are anticipated during FY 1990.

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BUDGET STATUS

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(cost center/function)	Program Hours	Program Dollars	Actual Hours	Actual Dollars
A. VOLUME COUNTS				
1. Automatic Recorder (2210/702)	10,000	271,300	14,034	247,972
2. Primary Road (2210/720)	24,000	321,400	24,145	352,159
(2610/720)			413	
3. Secondary Road (2210/709)	24,680	347,100	19,578	280,776
4. Urban Area (2210/750)	2,700	33,900	840	11,865
5. Municipal (2210/758)	5,800	76,700	5,860	80,029
B. VEHICLE WEIGHT SURVEY(2210/750)	7,000	95,300	6,387	88,314
C. ORIGIN-DESTINATION (2210/726)	100	1,500	96	1,562
D. FORECASTING (2310/739)	4,900	97,800	4,667	83,687
TOTALS	79,180	1,245,000	76,020	1,146,364

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ACCOMPLISHMENTS - FY 89-90

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A. VOLUME COUNTS - Traffic data were collected using the 123 Automatic Traffic Recorder stations. Monthly and annual reports were prepared and computer tapes were furnished to the FHWA.

One new ATR station was installed for speed monitoring as a result of the speed limit change from 55 to 65 mph. The new station is located in Council Bluffs on I-29/80.

Two ATR stations were upgraded to obtain vehicle type by the 13 Traffic Monitoring Guide classifications. Installation at central Iowa sites (west of Ames on US 30; near Perry on Iowa 141) was made for convenient access by Ames staff. This was the first step of the plan to install vehicle classification equipment at 30 existing ATR locations.

Seven induction loops were replaced at two ATR locations. Loop failures are usually related to pavement deterioration, reconstruction, or maintenance operations. The piezo sensors at the US 30 site west of Ames were replaced.

Traffic counters and induction loops were installed at 11 truck weigh stations on the Primary highway system at the request of the Motor Vehicle Division.

The summer count program was completed in the northeast 25 counties. Machine classification counts replaced the manual 24-hour control stations and the rural primary manual counts. Machines were also used to make 24-hour counts on the Secondary Road System (instead of manual 4- hour counts).

A number of secondary and urban area counts were rescheduled because of flooding along the Mississippi River in May-June, 1990. This resulted in an underrun in Functions 709 and 750.

Motorcycle helmet use, vehicle occupancy, and bicycle travel data were collected as part of the summer count program. Screenline and cordon-line counts were completed in the Cedar Rapids, Dubuque, and Waterloo urbanized areas. City and county traffic maps were prepared and distributed.

Traffic data were supplied for 6000 requests. These required 1000 written responses and the remainder was handled by phone. This information was requested by DOT offices, other state agencies, and private businesses.

- B. VEHICLE WEIGHT SURVEY - Assistance continued with the testing of the Weight and Classification (AWAC) stations; a piezo sensor was replaced at the I-35 site south of Ames.

Automatic weigh-in-motion equipment was installed at the SHRP SPS sites on I-35 north of Ankeny and on Iowa 196 near Sac City.

The 1989 truck weight program using 16 static scale sites was completed. W-Tables were developed using the new FHWA PC software package and a report is being prepared.

- C. RURAL ORIGIN AND DESTINATION SURVEYS - Requests for historical data were supplied from microfilm records.

- D. FORECASTING - More than 230 requests for traffic forecasts, cost-benefit analyses, and axle-load estimates were received and completed.

Ninety-five percent of the programmed work hours were used along with 86% of the program budget. The hourly rate used in the budget estimate did not represent the mix of labor used during the year.

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING AND RESEARCH PROGRAM
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Section 5. HIGHWAY STATISTICS

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OBJECTIVE AND PROPOSED WORK - July 1, 1989/June 30, 1990

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The objectives are to maintain current highway route mileage and route descriptions and to provide summary reports of motor vehicle operators, fuel, and highway finance statistics.

A. MILEAGE - The Office of Transportation Inventory will maintain current route mileages for State Primary, Federal-Aid Primary, Federal-Aid Secondary, Federal-Aid Urban, Farm-to-Market, and local roads. Annual reports will be submitted to FHWA by magnetic tape and will include summary mileage and other HPMS information. Vehicle-mile statistics will continue to be computed during the year.

B. MOTOR VEHICLES, OPERATORS, AND FUEL - The Office of Economic Analysis will respond to special requests and prepare the following FHWA reports:

1. State Motor Fuel Tax Collections (FHWA-556)
2. Receipts Motor Vehicle Operator for Hire and Other Motor Carriers (FHWA-571)
3. Motor Fuel Consumption (FHWA-551 Monthly)
4. State Motor Vehicle Registrations (FHWA-561)
5. State Operators-Chauffeurs Licenses (FHWA-562)
6. State Motor Vehicle Registration Fees (FHWA-566)

Monthly fuel report summaries are normally available from the Iowa Department of Revenue two months after retail sales.

C. FINANCE - The Office of Transportation Inventory will coordinate the Municipal Finance Reports as required by Iowa Code Sections 312.12 and 312.14. The following reports will be prepared and submitted to the FHWA:

1. State Highway Income (FHWA 531)
2. State Highway Expenditure (FHWA-532)
3. State Highway Obligations Issues (FHWA-541)
4. Status of State Highway Debt (FHWA-542)
5. Local Road and Street Finance Report (FHWA-536)
6. Capitol Outlay and Maintenance Expenditures (FHWA-534)

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BUDGET STATUS

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(cost center/function	Program Hours	Program Dollars	Actual Hours	Actual Dollars
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HIGHWAY STATISTICS (2210/701)	15,820		16,241	
(2110/701)	1,790		2,490	
(2310/701)	40		344	
(2020/701)			40	
TOTAL	17,650	300,500	19,115	343,383

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ACCOMPLISHMENTS - FY 89-90

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Highway statistical records were maintained as proposed and all FHWA reports were prepared and submitted.

Actual hours charged to the function overran by eight percent; dollars expended overran 14 %. The hourly rate used in the program estimate did not represent the appropriate mix of staff wage rates.

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Section 6. ECONOMIC AND FISCAL

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OBJECTIVE AND PROPOSED WORK - FY 89-90

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The objective is to prepare project planning, environmental, and economic assessments of transportation projects.

A. PROJECT PLANNING & ENVIRONMENTAL - During fiscal 1990, evaluation of highway projects will continue as needed to fulfill the requirements of environmental impact regulations (23 CFR Part 771), public hearing regulations, and the Iowa Action Plan. Final project environmental document costs incurred after the public hearing will be identified as nonparticipating in the HPR Program.

Additional comprehensive highway pre-location studies will be initiated to provide information relative to the long-range plan for the state highway system and economic growth in Iowa. This list was expanded in December, 1988 with the addition of District-wide commercial network pre-location studies.

Work will continue on incorporating the use of CADD in location studies and graphic support. Future projects include U.S. 6 and U.S. 69 in Polk County and are dependent upon receiving road design surveys.

An estimated 30 environmental and planning reports will be prepared from July, 1989 to July, 1990:

Reevaluations	1
Environmental Assessments	10
Findings of No Significant Im	6
Pre-Location Studies	2
Concept Statements	10
Environmental Impact Statemen	1

In response to the 1989 Federal Highway Appropriations Act, a study consultant will determine the feasibility and necessity to construct a four-lane highway from St. Louis to St. Paul. A five-state steering committee set the scope of study and selected the consultant.

B. RECREATIONAL TRAILS - In response to recent legislation, a state recreational trails program has been developed, providing one million dollars annually for funding assistance. A consultant has been selected to develop a statewide trails plan which is scheduled for completion in early 1990.

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BUDGET STATUS

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(cost center/function	Program Hours	Program Dollars	Actual Hours	Actual Dollars
A. PROJECT PLANNING & ENVIRONMENT				
(2410/738	34,590	811,200	30,492	762,064
B. RECREATIONAL TRAILS (2410/737)			849	21,162

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ACCOMPLISHMENTS - FY 89-90

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A. PROJECT PLANNING & ENVIRONMENTAL - Project planning studies active during the year included:

I. ENVIRONMENTAL ASSESSMENTS (EA) AND FINDING OF NO SIGNIFICANCE (FONSI)

1. US 18, US 218 - Floyd County, Rudd to Charles City (EA)
2. IA 23, IA 137 - Wapello/Mahaska Counties, Chillicothe Stub to Oskaloosa (EA-FONSI)
3. US 61 - Lee County, US 218 to IA 2, Categorical Exclusion
4. US 61 - Muscatine/Scott Counties, Muscatine to Blue Grass (EA)
5. US 61 between DeWitt and Maquoketa, draft 4(f) statement
6. IA 163 - Mahaska/Marion Counties, Oskaloosa (bypass) to Pella (EA)
7. US 218 - Henry/Muscatine Counties, Mt. Pleasant to IA 92 (EA-FONSI)

II. PRE-LOCATION STUDIES

1. IA 5, US 34, US 63, IA 92, IA 163, IA 137, IA 5, US 218, & US 61; South Central and Southeast Iowa
2. US 30 - Ogden to IA 201/Benton County
3. US 34, US 59, US 71, IA 92, & IA 385; Southwest Iowa
4. US 75 & IA 60 - Sioux City to Minnesota

III. CONCEPT STATEMENTS

1. US 61 - Lee County, US 218 to IA 2
2. US 61 - Muscatine/Scott Counties, Muscatine to Blue Grass
3. US 75 - Woodbury County, Sioux City Bypass
4. IA 137 & IA 23 - Chillicothe Stub to Oskaloosa
5. US 218 - Henry/Washington Counties, Mt. Pleasant to IA 92

IV. ENVIRONMENTAL IMPACT STATEMENTS (EIS)

1. US 20 relocation in Hardin/Grundy Counties

V. REEVALUATIONS

1. US 30 - Marshall County, Marshalltown Bypass
2. US 65 - Polk County, Relocation in Des Moines
3. IA 58 - Black Hawk County, Relocation in Cedar Falls
4. IA 163 - Marion County, Pella Bypass
5. IA 141 - Dallas County, US 169 to Granger
6. US 218 - Black Hawk County, Cedar Falls to Co. Rd. C-57
7. US 218 - Black Hawk County, Relocation at Co. Rd. C-57

The St. Louis to St. Paul Corridor Feasibility and Necessity Study was completed. This study was funded by the 1989 Transportation Appropriations Act and involved Iowa, Minnesota and Missouri with assistance from Illinois and Wisconsin. Results were presented to the Iowa DOT Commission in April, 1990.

B. RECREATIONAL TRAILS

The "Iowa Statewide Recreational Trails Plan" was completed in February, 1990. Iowa DOT was the lead agency with assistance from the Department of Natural Resources, Department of Economic Development and Department of Cultural Affairs. Input from a Technical Advisory Group and five public meetings was used in development of the plan. Project development contracts were awarded from two rounds of funding applications during the year.

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Section 7. SYSTEMS & PROGRAMMING

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OBJECTIVE AND PROPOSED WORK - FY 89-90

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The objectives are to maintain a continuing statewide transportation process, develop program funding alternatives, support economic development programs, and to update the transportation improvement program.

A. SUFFICIENCY RATINGS - Data will be maintained and updated on the primary road and structures file. This data will be analyzed and a report published containing sufficiency ratings for all roads and bridges on the Iowa Primary System.

Airport sufficiency data will be updated for airports currently rated.

B. HIGHWAY NEEDS - Work will continue on the cooperative AASHTO/FHWA project to identify a Highway System of National Significance.

Base records will be updated to reflect functional classification changes, new construction, and system modifications. Monitoring of state and federal functional classification changes will continue between the District Planning and central office personnel.

Work on the Quadrennial Need Study will include development of unit cost data, design guides, surveys and questionnaires. The input data for the battery of computer programs for needs determination will be updated for preliminary needs calculations.

C. RISE - Staff will continue to administer the RISE program which provides funding for road projects that support economic development. Staff will provide guidance to applicants, review and evaluate project applications, and recommend action to the Commission on individual project applications. Projects to be funded by the State's share of the RISE fund will be identified and included in the DOT's programming process.

Information on completed RISE projects is being collected from RISE applications including information on jobs assisted, private capital investment, etc. This data will be used in the evaluation of the RISE program.

D. TRANS PLAN - Work will continue on development of the Commercial and Industrial Network System Plan. Area economic impact studies will be undertaken for each of the 55 corridors in the C/I Network.

Methodologies will be developed to determine the level and staging of improvements as part of the system plan and economic studies.

Work will continue on the transportation finance programs including more detailed studies of modal funding needs, developing funding strategies, and evaluation of the Road Use Tax formulas. The development of funding strategies will replace, in part, the preparation of a highway capital investment plan.

Upon completion of the Upper Mississippi River Transportation Economics Study, it is expected that work will be reactivated on the truck study with the analysis of data to determine the nature, type, amount, and quality of service offered. The study will address trucking issues and analyze implications of the cost and quality of service. The study will evaluate modifications to present regulatory laws, rules, and procedures that affect trucking operations. Work will continue on the study of primary service in urban areas.

E. AIRPORTS - Monitoring of consultant airport development and master plan contracts will continue and some new studies will be initiated. The Airport Improvement Program will be formalized. The air element of the Five-Year Transportation Improvement Program and the State Aviation System Plan will be updated. Aircraft activity counting will be continued at 18 locations by the District Planning Engineers. A consultant study identifying airport facility improvements needed to support commercial air service will be completed.

F. PUBLIC TRANSPORTATION - The Transit Development Planning (TDP) process will continue. TDP guidelines will be reviewed and appropriate changes made. The UMTA transit planning program will be carried out and special studies and surveys will be conducted at selected locations.

The transit portion of the Five-Year Transportation Improvement Program will be updated. An application for FY 1990 UMTA Section 8 and 18 transit planning funds will be prepared.

G. RAILROAD - A rail planning update will be proposed with a systemwide economic analysis of both rail and alternative highway systems. Since conditions affecting state rail assistance needs have changed significantly over the past decade, one element of the rail plan will be a comprehensive review of state programs and the policies upon which they are based. Railroad financial and operating statistics will be computed and analyzed for each of Iowa's 22 operating railroads. In addition to rail mergers, abandonment statements, acquisitions, rehabilitation, and rail economic development proposals will be reviewed and associated economic analyses will be performed. An annual program of projects for the Department's Five-Year Improvement Program will be updated and a 1990 rail planning program will be prepared consistent with federal funding availability. Annual railroad waybill samples will be obtained from the Interstate Commerce Commission. This sample data will be expanded and factored to represent all railroad traffic shipments in the state. This updated traffic base will provide an independent means of evaluating new applications for state acquisition or rehabilitation assistance.

H. RIVER - Continuing studies of navigation, recreation use, water supply, water diversion, channel degradation, and environmental concerns will be made in response to DOT interests. The river element of the DOT Five-Year Improvement Program will be updated. The Upper Mississippi River Transportation Economics Study model and results will be used to further analyze river efficiencies.

I. HIGHWAY (NON HPR-PARTICIPATING) - All highway mode work not predetermined as eligible for FHWA Highway Planning Fund reimbursement is included. Unscheduled special studies (increased axle weights, long trucks, finance studies, etc.) are examples. Special studies related to highway programming priorities will be continued and include:

1. Development of highway safety programming process.
2. Improvement of pavement management system to assist with pavement preservation priority methods.
3. Strengthening program coordination with county and city officials.

Staff will continue to administer the Traffic Safety Improvement Program which provides for road projects to enhance safety. Staff will provide guidance to applicants, review and evaluate project applications, and recommend action to the Commission on individual projects.

The preparation of final EIS reports, conduct of project location public hearings, and the preparation of the highway element of the DOT Five-Year Improvement Program are other items included in function 722.

Time on State Park and Institutional Road Programming will be included as function 768.

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BUDGET STATUS

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(cost center/function	Program Hours	Program Dollars	Actual Hours	Actual Dollars
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A. SUFFICIENCY RATINGS				
(2020/727)	150		197	
(2210/727)	620		396	
(2310/727)	1,000		514	
TOTAL	1,770	39,400	1,107	26,985
B. HIGHWAY NEEDS				
(2020/733)	480		108	
(2210/733)	4,620		3,535	
(2310/733)	13,300		8,546	
(2410/733)			20	
TOTAL	18,400	337,100	12,209	253,259
C. RISE				
(2020/762)	200		80	
(2310/762)	6,300		8,118	
TOTAL	6,500	156,900	8,198	194,766
D. TRANS PLAN				
(2020/763)	2,000		1,753	
(2310/763)	9,500		11,284	
(2610/763)	520		72	
TOTAL	12,020	298,300	13,109	330,599
E. AIRPORTS				
(2000/765)	600		400	
(2210/765)			137	
(2310/765)	5,000		6,767	
(2610/765)	1,040		452	
(2510/765)	1,580		1,592	
TOTAL	8,220		9,348	
F. PUBLIC TRANSPORTATION				
(2020/745)			4	
(2310/745)	1,800		2,241	
(2610/745)	520		324	
TOTAL	2,320		2,569	
G. RAILROAD				
(2310/766)	8,300		5,854	
(2610/766)	520		169	
TOTAL	8,820		6,023	
H. RIVER				
(2310/767)	900		641	
(2610/767)	260		142	
TOTAL	1,160		783	
I. HIGHWAY (NON-HPR PARTICIPATING)				
(2210/722)			258	
(2410/722)	8,500		9,612	
(2610/722)	3,640		4,380	
TOTAL	12,140		14,250	
(2610/768)	1,040		1,294	

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ACCOMPLISHMENTS - FY 89-90

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A. SUFFICIENCY RATINGS - Structural adequacy ratings and other road and structures base record data for Primary roads were updated. The airport sufficiency data was also updated. Annual reports for the Primary Road System and the state airport system were completed.

Underrun on this function was due to the streamlining of procedures for analyzing the urban typical sections and increased staff efficiency in preparing the annual reports.

B. HIGHWAY NEEDS - Questionnaires to determine the county and municipal project construction costs for the Quadrennial Need Study were processed. Estimates of unit construction costs for primary roads and development of average maintenance costs for primary, secondary, and municipal roads from historical reports were completed. Design guides were prepared in cooperation with the Iowa County Engineer's Association and the Iowa Public Works Association. Cost and design criteria were also reviewed with state park and institutional road agencies.

Computer programs for estimating the existing and accruing needs on the state and local highway systems were adjusted to include the revised design criteria and the updated administration, construction, engineering, and maintenance costs for each system.

The computer conversion routines between the inventory base record system and the need study analysis programs were revised as needed. Data processing to determine the 1990-2009 highway needs began in June and will continue into FY 1991. Receipt of the base record data was delayed and much of the analysis work will carry over into FY 1991. This caused a significant underrun in FY 1990 for this function and will probably cause an overrun in FY 1991 when the work will be completed.

The final update of Iowa's Principal Arterial System was completed and submitted to the FHWA.

Input from the Metropolitan Planning Organizations and Regional Planning Agencies for development of Iowa's Highway System of National Significance was obtained. Routes were also coordinated with adjacent states. A preliminary Highway System of National Significance for Iowa was completed and submitted to the Federal Highway Administration.

C. RISE - Staff received and evaluated 43 applications; 23 received staff funding recommendations and were approved by the Transportation Commission. The total RISE grant and loan funds committed to these projects was \$9,045,559. The funds are expected to assist in creation or retention of 1,156 jobs and over \$165 million in capital investment. Since the beginning of the program, 190 RISE projects have been funded with 12,755 jobs assisted and over \$880 million of associated capital investment.

A monitoring system was established to query RISE recipients about the status of the road project and the economic development. These findings are reported to the Transportation Commission.

More staff time was required to collect and analyze information on completed projects than anticipated. This task will continue to increase as the program matures.

D. TRANSPLAN - The following tasks were completed during the development of a system plan for the Commercial and Industrial Network (CIN):

- Analysis of demographic trends at county and state levels.
- Analysis of long-term changes in the economic character of the state at the county level.
- Analysis of accidents on the CIN during 1984-1988 by major intersection and link.
- Analysis of historic traffic on the CIN.
- Establishment of Development Guidelines for the CIN.
- Presented a paper describing methods used to prioritize improvements on the CIN to a special Transportation Research Board conference in Williamsburg, Virginia.

Other tasks initiated during the past year were:

- Development of county level population and economic forecasts.
- Development of a causal based econometric traffic forecasting model.
- Development of improvement prioritization and programming methods.

Ongoing activities include compilation and maintenance of highway planning databases.

Refinements were made to the five-level highway system classifications to reflect changes since Commission approval. Time to complete this system and to prepare the paper for the TRB Conference was not included in the 1990 Program budget estimates.

E. AIRPORTS - The air element of the Five-Year Transportation Improvement Program was updated. A grant application was submitted and approved by the Federal Aviation Administration (FAA) for preparation of the 1990 State Aviation System Plan. The grant provided \$138,150 of federal funds to be matched by \$15,350 of state support. FAA also approved purchase of four RENS counters to expedite counting of aircraft activity at public use airports.

Staff provided support to the legislative committee studying the feasibility of establishing intrastate commercial air service. This included assisting with project consultant selection and providing background information to the study consultant.

Aircraft activity was counted at 16 airports. Staff also evaluated project proposals for State Aviation Fund assistance.

Budget overrun was caused by additional staff time directed to assist with the intrastate air service legislative study, stratification study of public airports, update of airport sufficiency rating software, and evaluation of the airport activity count program.

F. PUBLIC TRANSPORTATION - Transit Development Plans (TDPs) were prepared by the regional planning agencies for the sixteen regional and eight small urban transit systems using UMTA Section 8 and 18 transit planning funds. In addition, fourteen special studies or surveys were completed or transit systems at selected locations.

The Transit Development Planning Guidelines manual was updated and an application for Fy 1991 UMTA Section 8 and 18 transit planning funds was prepared.

The budget overrun was due to additional staff time required to provide assistance in the review of TDPs and special project reports.

G. RAILROAD - Three chapters of a rail planning update were completed. Work began on rail system stratification and prioritization. Railroad financial and operating statistics were computed and analyzed for each of Iowa's 22 operating railroads. Railroad mergers, abandonments, acquisitions, rehabilitation, and economic development proposals were reviewed and economic analyses were made.

The annual program of projects for the Iowa DOT Five-Year Improvement Program was updated in conjunction with the available federal funds.

Annual railroad waybill samples were obtained from the Interstate Commerce Commission and were factored to represent all rail traffic shipments in Iowa. This traffic base provides another means of evaluating application for state acquisition or rehabilitation assistance.

A Federal Rail Administration planning grant application for 1990 was prepared and submitted. Class II and Class III railroad annual report forms were revised and combined with the Iowa Department of Revenue's report.

Review and comment was made on the proposed FRA benefit/cost methodology. Iowa procedures will be changed to be consistent.

The underrun in rail planning was due to diverting staff to priority work on other modes.

H. RIVER - River planning involved continued participation in the Mississippi and Missouri River Advisory Committee meetings. Staff helped update the river element for the DOT Five-Year Improvement Program.

Staff participated in the Corps of Engineers' study of the Missouri River Reservoir System operations under drought conditions. The effects of reduced Missouri River flows on navigation, recreation use, and water supply were considered.

Results of the Upper Mississippi River Transportation Economics Study were presented to the Corps of Engineers, Inland Waterways Users Board, National Waterways Conference, Permanent International Association of Navigation Congresses, and Mississippi River Advisory Committee. Staff concentrated on the promotion of the study and use of the computer model. This was done in lieu of doing the river efficiency analysis studies contemplated when the budget was prepared. As a result the time for river studies underran the budget estimate.

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING AND RESEARCH PROGRAM
PART 1. PLANNING

PART 1. PLANNING

Section 8. URBAN TRANSPORTATION

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OBJECTIVE AND PROPOSED WORK - FY 89-90

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The objectives are to coordinate local/state planning with federal guidelines; administer FHWA financial assistance for planning; provide technical and administrative assistance; provide computer support for urban area traffic models; and prepare project traffic estimates.

A. URBANIZED AREAS - The Advance Planning Office will provide technical and administrative assistance to the Metropolitan Planning Agencies.

Work programs have been prepared for the Cedar Rapids, Council Bluffs, Davenport, Des Moines, Dubuque, Iowa City, Sioux City, and Waterloo urbanized areas. These programs contain detailed descriptions of transportation planning work tasks to be accomplished during FY 1990 and are by reference included as part of the HPR work program.

The DOT staff will continue to provide assistance to the Waterloo MPO as the Interstate Substitution Program progresses from project development/prioritization to project execution in connection with the withdrawal of an I-380 route segment. The DOT will continue to sponsor technical training for MPO staffs and will actively participate in the jointly sponsored FHWA/UMTA field reviews in FY 1990. Improvement of the planning process to provide information for transportation decisions in the urbanized areas will be pursued. A quarterly report to document work progress for each MPO will be prepared.

DOT District Planners will continue to participate in the Technical and Policy Committee activities.

B. URBAN AREAS (less than 50,000 population)

The Advance Planning Office will continue to provide traffic estimates and other technical support. This will be provided in response to requests by these cities and limited by the staff time available.

C. PL FUNDS - The Advance Planning Office will coordinate the continued PL funding of urbanized area planning. Administrative costs are included in function 707.

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BUDGET STATUS

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(cost center/function		Program Hours	Program Dollars	Actual Hours	Actual Dollars
		-----	-----	-----	-----
A. URBANIZED AREAS	(2020/707)	600		418	
	(2310/707)	5,600		6,505	
	TOTAL	6,200	153,000	6,923	175,083
B. URBAN AREAS	(2020/708)			20	
	(2310/708)	320	7000	280	
	TOTAL	320	7000	300	6773

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ACCOMPLISHMENTS - FY 89-90

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A. URBANIZED AREAS - The Advance Planning Office assisted the eight MPOs with preparation of Unified Work Programs, Transportation Improvement Programs, and Transportation System Management studies. The transportation planning process was certified in all urbanized areas.

DOT staff administered the FHWA transportation planning (PL) program in the eight urbanized areas. They also coordinated the UMTA transit planning funds (Section 8) in the five areas with less than 200,000 population. Annual agreements were prepared for continuation of the cooperative transportation planning process.

Staff assistance activities included Technical and Policy Committee participation, traffic model evaluations, transportation project coordination, MPO staff training enrollment, review of regulations and policies affecting urban systems, and participation in the MPO reviews in Cedar Rapids and Des Moines by FHWA/UMTA staff. In addition, the following items were unique to each area:

CEDAR RAPIDS -----

- Continued technical assistance for the 2005 update of the Major Street Plan.
- Provided traffic count information from the DOT count data system.
- Completed traffic forecasts for C Avenue and Boysen Road and the final design on the Marion Bypass.
- Received two immediate opportunity RISE applications. One proposed extension of 27th Avenue SW 0.06 mile into an industrial site. A second project proposed widening of 6th Street SW and the paving of 60th Avenue SW and Harnischfeger Drive.

COUNCIL BLUFFS -----

- Provided traffic forecast for old highway Iowa 375 at the Burlington Northern Railroad crossing.

DAVENPORT -----

- Provided information on the DOT 1990 traffic count program. The state will be conducting traffic counts in the Davenport area in the summer of 1990.
- Completed four traffic estimates: US 67 from Gaines Street to Iowa Street; US 67 from Mound Street to ECL Davenport; I-280 detour traffic on Iowa 22; and US 67 from 23rd Street to 17th Street.
- Provided accident and traffic count information from the Office of Transportation Inventory and the ALAS accident record system.

DES MOINES -----

- Provided technical assistance to maintain the 2000 Street and Highway Plan.
- Provided computer and technical assistance with testing and evaluation of QRS II and TRANSPRO travel forecasting models.
- Provided accident and traffic count data from ALAS and base record files.
- Completed five traffic estimates: Iowa 28 from West Junction Iowa 5 to Ashworth Road; US 65/69 near I-235 -- detour route on local streets; US 6 from Lower Beaver Avenue to Harding Road; US 69 from University Avenue to Ankeny; and at Camp Dodge.
- Reviewed local development RISE project proposing construction of an interchange on I35/80 at 86th Street and the widening of 1800 feet of 86th Street to 54th Avenue.
- Provided technical assistance on the Des Moines Area Freeway Study.

DUBUQUE -----

- Assisted with development of a long-range transportation plan monitoring system.
- Provided technical assistance for preparation of traffic and transportation studies for US 20 and the Northwest Arterial.
- Provided assistance and resource materials for development of transportation system planning techniques.
- Completed a traffic estimate on US 61 from 9th Street to 11th Street.
- Reviewed two local development RISE projects: Extension of Chavenelle Road west 0.23 mile; and proposed construction of East 5th Street and reconstruction of East 6th Street and Bell Street at Ice Harbor.

IOWA CITY -----

- Provided information on the Iowa DOT 1990 traffic count program.
- Provided accident and traffic count information from the ALAS accident record and Transportation Inventory record systems.
- Assisted the FHWA calibrate the QRS II travel forecasting model. Provided technical assistance to MPO in operation of QRS II.
- Completed a traffic estimate in Coralville: US 6 frontage road from First Avenue to Rocky Shore.

SIOUX CITY -----

- Provided technical assistance on corridor studies for relocated US 75.
- Completed two traffic estimates: US 75 at 3rd Street; and relocated US 75.
- Reviewed two local development RISE projects: paving 1.34 miles of Harbor Drive; and paving 0.89 mile of Park Road.
- Assisted MPO with updating street and highway network for use with QRS II travel forecasting model.

WATERLOO -----

- Provided technical assistance in local and state traffic and transportation studies, including design and corridor traffic estimates for interstate substitution projects.
- Assisted with development and execution of the MPO/DOT interstate substitution agreement and program of projects spending plan.
- Maintained and updated project cost estimates for interstated substitution project candidates.
- Monitored state and local expenditures of interstate substitution funds.
- Assisted MPO with implementation of candidate interstate substitution projects.
- Assisted the MPO with planning for post-interstate substitution program needs.
- Reviewed an immediate opportunity RISE project which proposed paving of Big Rock Road east of the Waterloo Airport.

Time on Function 707 exceeded the budget due to additional work in Des Moines and Dubuque.

B. URBAN AREAS - The Advance Planning Office provided assistance in the preparation of the annual Transit Development Plan in Ames, Burlington, Clinton, Fort Dodge, Marshalltown, Mason City, and Ottumwa. Other special items done included:

AMES -----

- Completed traffic estimate on US 69 from SCL to NCL of Ames.

BURLINGTON -----

- Completed traffic estimates on US 34 at the Curran Street interchange and at a CBD grade separation.

CLINTON -----

- Completed traffic estimate on Iowa 136 from US 67 to 16th Street.

OTTUMWA -----

- Completed traffic estimate on the proposed relocation of Iowa 23.

Slightly less staff time was required to provide planning support to the smaller urban areas than originally budgeted due to fewer requests for service.

IOWA DEPARTMENT OF TRANSPORTATION
PLANNING AND RESEARCH PROGRAM
PART 1. PLANNING

PART 1. PLANNING

Section 9. SPEED STUDIES

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OBJECTIVE AND PROPOSED WORK - FY 89-90

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The objective is to determine the level of 55 MPH highway speed limit compliance by monitoring vehicle speeds.

Four quarters of speed monitoring data will be collected using the permanent equipment installations at 18 sites each quarter.

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BUDGET STATUS

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The proposed expenditure of \$7,500 is intended to cover occasional equipment malfunction which requires field personnel to collect the data and preparation of reports by the Office of Maintenance.

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ACCOMPLISHMENTS - FY 89-90

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A Quarterly Speed Monitoring Report was prepared using data collected at 18 sample sites.

Total expenditures of \$1,926 reflects the cost of report preparation and minimal field work due to equipment malfunction.

R E S E A R C H P R O J E C T S U M M A R Y - F Y 1 9 9 0

Work Func.	Project No.	Study Title	Est. \$ FY 1990	HPR-PR Expenditure
771	ADMINISTRATION			
	90-1	TRB Correlation Service	\$58,030	\$0
774	IMPLEMENTATION PROJECTS		\$115,000	\$81,380
	90-2.1	Use of AWACS		
	90-2.2	Pavement/Bridge Management		
	90-2.3	Transportation Safety		
	90-2.4	Analysis of Low Cost AWACS		
	9085-003	Pavement Mgmt. Development		
	9085-003	Pavt. Mgmt. 18 kip - Ph. II		
773	PROPOSED STUDIES		\$38,000	\$59,628
	89-1	Highway Assoc. Research		
	87-4	Enforcement Scale P & B Plan		
	86-3	Traffic Safety Research		
	85-4	Trans.Groove/Traffic Noise		
	TOTAL HPR-PR PROJECTS		\$211,030	\$141,008
	OTHER RESEARCH - NOT HPR FUNDED			
777	RTAP-071	Technology Transfer/ISU	\$100,000	
777	DEMO #97	Video Imagery System	\$166,000	
777	9000AWAC	Contd.Evaluation of AWACS		
772	9078INST	Pavement Instrumentation		
765	9083-001	Recording Aircraft Activity		
765	9083-002	Airport Land Use Guidance		
				Funds Authorized
POOLED FUND STUDIES				
776	HPR-4(190)	Natl. Coop. Hwy. Res. Prgm.	\$108,300	\$104,578
776	HPR-2(126)	Integrated Drainage Design	\$5,000	\$5,000
776	HPR-2(144)	Testing Small Sign Supports	\$10,000	\$5,000
776	HPR-2(147)	Disposal of Hwy.Test.Waste	\$5,000	\$5,000
776	HPR-2(148)	Signal Timing Update	\$10,000	\$10,000
776	HPR-2(150)	D,C&R of Reinf.Conc.Pavts.	\$5,000	\$5,000
776	HPR-2(151)	Natl.Geotechnical Sites	\$4,000	\$4,000
776	HPR-2(153)	Gradation Test./A.C. Mixes	\$3,000	\$3,000
776	HPL-2(001)	GPS For Trans. Planning	\$15,000	\$15,000
	Total Pooled Fund Studies		\$165,300	\$156,578

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 771. Administration

Title: TRANSPORTATION RESEARCH BOARD CORRELATION SERVICE
State Study No : 90-1 Research Area :
Control Number : Research Agency : Trans. Res.
Prin. Investigator: Bill McCall Federal Tech. Coord.:
Project Started : July 1, 1989 Completion Date : June 30, 1990
W.H. Contact: Louis Colucci (HRD-10)

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BUDGET STATUS

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Source: State	Prior Expend: \$
Est. Project Cost: \$	Current Year: \$ 58,030

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OBJECTIVE AND PROGRESS

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This item covers the annual subscription to the Transportation Research Board Correlation Service.

Activities of the Correlation Service include the collection of available information concerning transportation research, correlation of research activities, and dissemination of research information to member agencies.

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PROPOSED WORK FY 89-90

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Continuation of the annual TRB subscription.

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ACCOMPLISHMENTS FY 89-90

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The 1990 dues were paid and assigned to a non-participating HPR function. The expenditure is not included in the HPR status of funds report.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: FACILITATE USE OF AUTOMATIC WEIGHT & CLASSIFICATION
State Study No : 90-2.1 Research Area :
Control Number : Research Agency : Trans. Res.
Prin. Investigator: B. McCall Federal Tech. Coord.: E. Finn
Project Started : July 1, 1989 Completion Date : June 30, 1990

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BUDGET STATUS

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Source: State Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 10,000

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OBJECTIVE AND PROGRESS

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The objective of this project is to facilitate the use of automatic weight and classification equipment to support the planning and design of highways and the planning of motor vehicle enforcement operations.

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PROPOSED WORK FY 89-90

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- A. Prepare a case study using data from automatic weight and classification sysems to illustrate the use of the data in both the planning and design of highways and the planning of motor vehicle enforcement operations.
- B. Prepare a summary of methods used by other states in developing information for the planning and design of highways and operations of motor vehicle enforcement.

=====

ACCOMPLISHMENTS FY 89-90

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Automatic weight and classification data has been provided to the Office of Transportation Inventory. Weight tables were prepared using FHWA software.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: PAVEMENT AND BRIDGE MANAGEMENT

State Study No	:	90-2.2	Research Area	:	
Control Number	:		Research Agency	:	Trans. Res.
Prin. Investigator	:	R. Dankbar	Federal Tech. Coord.	:	F. Howell
Project Started	:			:	B. Brakke
			Completion Date	:	Continuing

BUDGET STATUS

Source:	State	Prior Expend:	\$
Est. Project Cost:	\$	Current Year:	\$

OBJECTIVE AND PROGRESS

The objective of this project is to support the implementation of technologies and methods used in pavement and bridge management.

PROPOSED WORK FY 89-90

A. Participate in the development and evaluation of technical methods for establishing pavement condition ratings, pavement life prediction models, and project and network optimization models.

B. Participate in the development and testing of technical methods supporting establishment of bridge condition ratings, life prediction models, and optimization models.

ACCOMPLISHMENT FY 89-90

A consultant was hired to develop design specifications for a highway location reference system to assist in implementation of pavement and bridge management. Information services now has two persons working full time on implementation of the consultant's recommendations.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: TRANSPORTATION SAFETY
State Study No : 90-2.3 Research Area :
Control Number : Research Agency : Trans. Res.
Prin. Investigator: S. Kadolph Federal Tech. Coord.: J. Latterell
Project Started : July 1, 1989 Completion Date : June 30, 1990

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BUDGET STATUS

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Source: State Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 20,000

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OBJECTIVE AND PROGRESS

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The objective of this project is to develop and maintain an implementation program that will support the Department's safety program.

=====

PROPOSED WORK FY 89-90

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A. Support the integration of information generated by videologging into the Department's safety program.

B. Develop an implementation program supporting the Department's safety program.

=====

ACCOMPLISHMENTS FY 89-90

=====

There was no activity on this project during the year.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: ANALYSIS OF LOW-COST WEIGHT & CLASSIFICATION SYSTEMS
State Study No : 90-2.4 Research Area :
Control Number : Research Agency : Trans. Res.
Prin. Investigator: Federal Tech. Coord.: E. Finn
Project Started : July 1, 1989 Completion Date : June 30, 1990

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BUDGET STATUS

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Source: State	Prior Expend:	\$
Est. Project Cost: \$	Current Year:	\$ 65,000

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OBJECTIVE AND PROGRESS

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The objective of this project is to evaluate new sensor technologies that lead to the development and implementation of a lower cost automatic weight and classification system.

=====

PROPOSED WORK FY 89-90

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Evaluate the use of low cost piezo film as a sensor for automatic weight and classification systems.

=====

ACCOMPLISHMENTS FY 89-90

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There was no activity in 1990.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: PAVEMENT MANAGEMENT DEVELOPMENT

State Study No :	Research Area :	Highway
Control Number : 90-85-0003	Research Agency :	Trans. Res.
Prin. Investigator: R. Dankbar	Federal Tech. Coord.:	E. Finn
Project Started : 1981	Completion Date :	Continuing

BUDGET STATUS

Source: State	Prior Expend: \$
Est. Project Cost: \$	Current Year: \$

OBJECTIVE AND PROGRESS

The objective of this project is to improve the planning, programming, design, construction, and maintenance process for Iowa's Primary Road System.

A pavement condition rating (PCR) system is being developed for Program Management to use as a tool in rating pavements. A 100 point scale and four pavement types are used in the rating system.

District Office staff are gaining confidence in the PCR rating system and using it more.

PROPOSED WORK FY 89-90

Work will continue on improvement of the PCR rating system.

ACCOMPLISHMENTS FY 89-90

PCR values are being used by Program Management as an aid in statewide pavement ratings.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 774. Implementation

Title: PAVEMENT MANAGEMENT 18 kip PHASE II
State Study No : Research Area : Highway
Control Number : 90-85-0003 Research Agency : Trans. Res.
Prin. Investigator: R. Dankbar Federal Tech. Coord.: E. Finn
Project Started : 1985 Completion Date : Continuing

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BUDGET STATUS

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Source: State	Prior Expend:	\$
Est. Project Cost: \$	Current Year:	\$

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OBJECTIVE AND PROGRESS

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The objective of this project is to develop a way of calculating the remaining life of the pavements in terms of remaining axle loadings vs. predicted loadings.

A complete history of estimated section loadings has been developed for Primary roads. These are compared by computer to predicted loadings used in pavement design and a calculated remaining life is reported annually for each section.

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PROPOSED WORK FY 89-90

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Make corrections for route changes and prepare annual report.

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ACCOMPLISHMENTS FY 89-90

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Beginning in 1991, 18 Kips will be a part of the base records and automatically computed.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 773. Proposed Studies

Title: HIGHWAY ASSOCIATED RESEARCH MONITORING
State Study No : 89-1 Research Area : Highway
Control Number : 90-85-002 Research Agency : Trans. Res.
Prin. Investigator: R. Dankbar Federal Tech. Coord.: E. Finn
Project Started : Oct. 1986 Completion Date : Continuing

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BUDGET STATUS

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Source: State Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 5,000

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OBJECTIVE AND PROGRESS

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The project objective is to assist DOT Division Directors by monitoring national and international highway research.

Special emphasis was placed on the development of pavement instrumentation demonstration projects for SHRP.

Twelve of the 66 candidate project sites submitted to SHRP for the general pavement studies (GPS) experiment and the long-term pavement performance (LTPP) tests have been selected for monitoring in Iowa. Special pavement studies (SPS) sites are being added to the program and maintained for pavement performance.

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PROPOSED WORK FY 89-90

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Contribute to the SHRP General Pavement Studies (GPS) experiment and the Special Pavement Studies (SPS) and the Long-Term Pavment Performance (LTPP) tests in Iowa.

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ACCOMPLISHMENTS FY 89-90

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Two SPS sites have been constructed and Automatic Weigh and Classification Systems installed. SHRP has been conducting tests on the GPS sites.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 773. Proposed Studies

Title: ENFORCEMENT SCALE PLACEMENT AND REHABILITATION PLAN
State Study No : 87-4 Research Area : Support
Control Number : 90-87-0002 Research Agency : Trans. Res.
Prin. Investigator: S. Kadolph Federal Tech. Coord.: E. Finn
Project Started : Completion Date : June 30, 1990

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BUDGET STATUS

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Source: State Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 12.000

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OBJECTIVE AND PROGRESS

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The project objective is to develop a 5-10 year plan to renovate and/or redeploy existing scales.

Substantial changes in commercial traffic has occurred since the primary scales were constructed and the interstate system completed. Some of the scales may no longer be in productive locations and six scales are not in operation because of age.

Initial work of locating productive scale sites and recommending changes in scale design has been done.

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PROPOSED WORK FY 89-90

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Work will continue on the identification of productive scale sites, locating potential relocation sites, and design of two sites on Interstate 80.

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ACCOMPLISHMENTS FY 89-90

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The design of roadways for the two replacement weigh stations on Interstate 80 has been completed. Draft specifications for a sorter weigh-in-motion scale was also prepared.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 773. Proposed Studies

Title: TRAFFIC SAFETY RESEARCH PROGRAM
State Study No : 86-3 Research Area :
Control Number : Research Agency : Trans. Res.
Prin. Investigator: S. Kadolph Federal Tech. Coord.: E. Finn
Project Started : Completion Date :

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BUDGET STATUS

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Source: State Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 16,000

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OBJECTIVE AND PROGRESS

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The objective of this project is to develop and maintain a basic research program which provides a synthesis of research studies and practice in support of the Department's safety program.

Research will include relating accident type and frequency to the Iowa highway environment, development of intersection accident rate statistics using entering vehicle count volumes, participation in the development of a data base, file linkages, and software to support safety analysis, and other priority work identified by the Bureau of Transportation Safety.

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ACCOMPLISHMENTS FY 89-90

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Experimental design and deployment of automatic vehicle classification system in Polk County on I-80 was accomplished. This experiment will be used to measure traffic data in the head-to-head construction zone.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 773. Proposed Studies

Title: EVALUATION OF TRANSVERSE GROOVE TEXTURING ON TRAFFIC
NOISE FREQUENCY AND SKID RESISTANCE

State Study No	: 85-4	Research Area	: Highway
Control Number	: 90-86-0016	Research Agency	: Trans. Res.
Prin. Investigator	: R. Dankbar	Federal Tech. Coord.	: E. Finn
Project Started	: 1986	Completion Date	: Dec. 1, 1989

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BUDGET STATUS

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Source: State	Prior Expend:	\$
Est. Project Cost: \$	Current Year:	\$ 5,000

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OBJECTIVE AND PROGRESS

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Made the original evaluation in 1986 using the mobile FHWA noise laboratory. Sufficient data was collected to recommend a 1 1/2" spacing (instead of 5/8") in the standard construction specifications.

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PROPOSED WORK FY 89-90

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Additional noise monitoring will be done during the summer of 1989 on San Marnan Drive in Waterloo. This roadway carries very little truck traffic.

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ACCOMPLISHMENTS FY 89-90

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Traffic noise from transverse grooving was monitored and the final report written. This project is now complete.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 777. Special Research Studies

Title: TECHNOLOGY TRANSFER PROGRAM
Project No. RTAP-0719(005) Research Area :
Control Number : 90-83-0024 Research Agency : Iowa State U.
Prin. Investigator: J. Whited Federal Tech. Coord.: E. Finn
Project Started : January, 1983 Completion Date : Continuing

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BUDGET STATUS

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Source: 50% FHWA, 50% Local Prior Expend: \$
Est. Project Cost: \$ Current Year: \$ 200,000

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OBJECTIVE AND PROGRESS

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The Technology Transfer Center is designed to assist local agencies in making the best use of new transportation technology and available resources.

The program facilitates flow of new methods and improved procedures to local jurisdictions responsible for maintaining transportation systems.

Many innovative ideas have been identified and shared as a result of this project.

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PROPOSED WORK FY 89-90

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Continue the program on a calendar year base. The 1989 program is funded: FHWA \$100,000; Safety 402 funds \$40,000; Primary Research \$40,000; Secondary Research \$60,000.

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ACCOMPLISHMENTS FY 89-90

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Technology Transfer Program is a continuing activity managed and directed by Iowa State University.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 777. Special Research Studies

Title: VIDEO IMAGERY SYSTEM FOR HIGHWAY APPLICATIONS
Demonstration Project No. 970 FHWA Work Order D1FH71-87-970-IA-27
Control Number : 90-88-VIMS Research Agency : Trans. Res.
Prin. Investigator: J. Whited Federal Tech. Coord.: E. Finn
Project Started : 10/7/87 Completion Date : 5/31/89

BUDGET STATUS

Source: FHWA 100% Prior Expend: \$
Est. Project Cost: \$ 166,000 Current Year: \$

OBJECTIVE AND PROGRESS

Demonstrate the performance characteristics of electronically shuttered video and optical image equipment while operating in a highway data survey van.

A contract has been awarded and the video equipment installed in the DOT van.

PROPOSED WORK FY 89-90

Field test the video equipment and begin use of office work stations to analyze the video images.

ACCOMPLISHMENTS FY 89-90

During field testing the vehicle was in a head-on collision which destroyed the van and recording equipment.

The final project report was completed.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 777. Special Research Studies

Title: CONTINUED EVALUATION OF A LOW COST AUTOMATIC
WEIGHT AND CLASSIFICATION SYSTEM

State Study No :	Research Area :
Control Number : 90-00-AWAC	Research Agency : Trans. Res.
Prin. Investigator: S. Sermet	Federal Tech. Coord.: E. Finn
Project Started : January 1, 1989	Completion Date : Dec. 31, 1989

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BUDGET STATUS

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Source:	Prior Expend: \$
Est. Project Cost: \$ 100,000	Current Year: \$

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OBJECTIVE AND PROGRESS

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The objective of this project is to monitor the accuracy of AWAC systems.

This includes weight estimates of axles, axle groups, and vehicle gross; performance of the classification system; establishment of temperature compensation look-up tables; measurement of static steering axle weights of 3S2 trucks in different seasons and time of day; evaluation of self-calibration stability and bias; feasibility of using a buried sensor; and establishment of operating costs.

Pavement temperature and related weight data have been collected and corresponding look-up table is established for a range of pavement temperatures.

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PROPOSED WORK FY 89-90

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Continue with the evaluations included in the study objectives.

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ACCOMPLISHMENTS FY 89-90

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One of the sensors installed in 1986 was replaced after the feeder cable was severed at the end of the channel near the shoulder line. Weight factors were monitored to show fluctuations based on time of day and day of week.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 772. Physical Research

Title: PAVEMENT INSTRUMENTATION

State Study No	: HR-293	Research Area	: Highway
Control Number	: 90-78-INST	Research Agency	: Trans. Res.
Prin. Investigator	: R. Dankbar	Federal Tech. Coord.	: E. Finn
Project Started	: May, 1986	Completion Date	: Dec. 31, 1992

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BUDGET STATUS

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Source: FHWA; State	Prior Expend:	\$
Est. Project Cost: \$	Current Year:	\$

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OBJECTIVE AND PROGRESS

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To evaluate the magnitude and frequency of dynamic loads applied to the pavement as related to the static loads used in pavement design and the demonstration of instrumentation for evaluation of pavement design and performance.

A contract was executed with Iowa State University for their participation. Five tubes were placed in the subbase crossing the westbound lane of I-80 at the test site to get recordings of moisture and density of the subbase. Some 120 instruments have been installed in a 40 foot segment of reconstructed pavement.

A weigh-in-motion and classification system has been installed and is integrated with strain gage data collection equipment. Software has also been installed to gather data from strain gages. Limited test data has been collected.

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PROPOSED WORK FY 89-90

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Continue with system debugging and data collection.

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ACCOMPLISHMENTS FY 89-90

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Software is nearly completed for collection of pavement deflection data by automation. These data can be collected now by manually triggering the computer.

Sufficient data has been collected for preliminary analysis and examination for effects on pavement.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 765. Air Mode Research

Title: AUTOMATIC RECORDING OF AIRCRAFT ACTIVITIES AT
AIRPORTS WITHOUT CONTROL TOWERS IN IOWA

State Study No :	Research Area :
Control Number : 90-83-0001	Research Agency : Trans. Res.
Prin. Investigator: K. Lidman	Federal Tech. Coord.:
Project Started : December, 1983	Completion Date : Continuing

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BUDGET STATUS

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Source: State	Prior Expend: \$
Est. Project Cost: \$ 100,000	Current Year: \$

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OBJECTIVE AND PROGRESS

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The objective of this project is to evaluate automatic aircraft recording devices to determine the feasibility of their use in a statewide aircraft activity counting program at airports without control towers.

An aircraft activity counter was evaluated and tested for one year. A statewide aircraft activity counting program was implemented and traffic counting completed at 44 airports. Summary reports have been completed.

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PROPOSED WORK FY 89-90

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Continue the airport activity program at facilities without control towers.

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ACCOMPLISHMENTS FY 89-90

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Completed and distributed the report "Iowa Automated Aircraft Activity Counting, 1988-1989." Completed aircraft activity counts at 16 additional airports, entered the results in the data base, and performed the statistical analysis.

PLANNING AND RESEARCH PROGRAM
IOWA DEPARTMENT OF TRANSPORTATION
JULY 1, 1989 - JUNE 30, 1990

PART 2. Research
Function 765. Air Mode Research

Title: LAND USE GUIDANCE PROGRAM FOR USE IN THE
VICINITY OF AIRPORTS

State Study No :	Research Area :
Control Number : 90-83-0002	Research Agency : Trans. Res.
Prin. Investigator: K. Lidman	Federal Tech. Coord.:
Project Started : July, 1983	Completion Date : Continuing

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BUDGET STATUS

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Source: State	Prior Expend: \$
Est. Project Cost: \$ 50,000	Current Year: \$

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OBJECTIVE AND PROGRESS

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The objective of this project is to develop a computer graphics program to display all aspects of land use guidance including the FAA Integrated Noise Model Contours and tall structure zoning.

This will provide an interactive computer graphics program to display environmental impacts of various operational strategies at airports. The interactive program will be transferable to CADD.

Completed literature review on land use planning and zoning and the integrated noise model.

Evaluated the Area Equivalent Method using Lotus 1-2-3 software. This procedure provides the noise contour area for given types of aircraft and the number of operations of each. This has been used as a screening tool to select airports for noise impact evaluation. The AEM was operated for three Iowa airports.

Evaluated the PC version of the Integrated Noise Model. This is a computer program to determine the total impact of aircraft noise at and around airports.

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PROPOSED WORK FY 89-90

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Continue the screening program to select airports for noise evaluation by using the most current data from the airport activity counting program.

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ACCOMPLISHMENTS FY 89-90

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Completed screening of 16 additional airports for noise evaluation using Area Equivalent Method - Version 2.