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## YOUR ALLY - THE MOTOR VEHICLE

EXTRACTS FROM AN ADDRESS DELIVERED BY PYKE JOHNSON, WASHINGTON REPRESENTATIVE OF THE NATIONAL AUTOMOBILE CHAMBER OF COMMERCE, AT THE SATURDAY AFTERNOON MEETING OF THE BUREAU ON FEBRUARY 27, 1926.

IN THE CONDUCT OF ANY WELL ORGANIZED MANUFACTURING BUSINESS, IT IS ESSENTIAL THAT THE VARIOUS DEPARTMENTS SHALL MEET FROM TIME TO TIME TO INSURE A PROPER COORDINATION OF THEIR ACTIVITIES.

SUCH AN OPPORTUNITY IS PROVIDED IN THIS MEETING SINCE, AFTER ALL, THOSE WHO MAKE THE CAR AND THOSE WHO BUILD THE ROAD ARE PART-NERS IN THE PRODUCTION OF HIGHWAY TRANSPORT.

ONLY AS EACH OF US HAS A FULL UNDERSTANDING OF THE PROBLEM CONFRONTING THE OTHER CAN WE HOPE TO TURN OUT AN ARTICLE WHICH WILL MEET THE REQUIREMENTS OF OUR CUSTOMERS WHO, FROM YOUR STANDPOINT AS FROM OURS, ARE THE OWNERS AND USERS, NOT ALONE OF THE 20,000,000MOTOR VEHICLES IN THE UNITED STATES BUT OF MOST OF THE OTHER 5,000,000 USERS WHO ARE SCATTERED THROUGHOUT 114 COUNTRIES.

WHAT IS IT THAT THE USER OF HIGHWAY TRANSPORT REQUIRES?

THE FIRST QUESTION THEN, WHICH BOTH OF US MUST ANSWER IS, WHAT DOES OUR CUSTOMER, THE PUBLIC, WANT?

AS CLOSELY AS WE CAN GUAGE THAT DEMAND IT MAY BE SUMMED UP AS FOLLOWS:

"GIVE US A SAFE, WELL-BUILT VEHICLE WHICH CAN BE DEPENDED UPON TO TAKE US WHERE WE WANT TO GO AT A REASONABLE COST PER MILE."

IF THE SAME QUESTION IS ASKED AS TO ROAD NEEDS, THE RESPONSE IS:

"GIVE US A SAFE, WELL-BUILT HIGHWAY, OVER WHICH WE CAN TRAVEL WHERE WE WANT TO GO AT A REASONABLE COST PER MILE."

IN OTHER WORDS THE PUBLIC TAKEN EN MASSE, IS NOT CONCERNING ITSELF SO MUCH WITH DETAILS OF DESIGN AND TYPES EITHER OF CAR OR ROAD AS IT IS WITH THE BASIC IDEA OF HAVING AT ITS SERVICE A THOROUGHLY RELIABLE, USABLE MEDIUM OF TRANSPORTATION.



## WHAT CAN BE DONE TO MEET THIS DEMAND?

THE NEXT QUESTION, THEN, IS HOW CAN WE BEST MEET THIS DEMAND? IT IS NOT THE FUNCTION OF THE CAR MANUFACTURER TO TELL YOU WHAT THE SPECIFICATIONS OF THE ROAD SHOULD BE, ANY MORE THAN A SALES MANAGER CAN TELL A PRODUCTION ENGINEER HOW THE CAR SHALL BE BUILT, BUT IT IS DESIRABLE THAT WE SHALL CONFER WITH YOU AS TO TRENDS IN CAR PRODUCTION, JUST AS IT IS IMPORTANT THAT WE SHALL KNOW WHAT THE TRENDS MAY BE IN ROAD PRODUCTION IF WE BOTH ARE TO MEET WITH THE REQUEST OF THE USING PUBLIC.

A LOOK INTO FUTURE CAR PRODUCTION

SPEAKING GENERALLY AGAIN, THE CHANGES WHICH ARE FORESEEN IN VEHICLE PRODUCTION MAY BE BRIEFLY SUMMARIZED.

THE CAR OF THE FUTURE WILL BE NO LARGER THAN IT IS TODAY AND INSTEAD WILL PROBABLY BE SOMEWHAT SMALLER IN ORDER TO FACILI-TATE MOVEMENT IN CONGESTED AREAS.

BALLOON TIRES WILL GRADUALLY BE PERFECTED AND WILL BECOME STANDARD EQUIPMENT.

LUBRICATION WILL BE MADE MORE EFFICIENT, PROBABLY ALMOST AUTOMATIC, WHICH WILL TEND TO EASE SPRING ACTION AND HAVE A PRO-NOUNCED EFFECT UPON ROAD WEAR.

MOTORS WILL BE EVEN BETTER DESIGNED THAN TODAY. THE HORSE-POWER WILL BE THE SAME OR GREATER, BUT THE WORKMANSHIP WILL IMPROVE AND THE ENGINE WILL BE MORE COMPACT.

A CONSTANT ADJUSTMENT IS TAKING PLACE IN CARBURETORS WHICH WILL INCREASE EFFICIENCY IN FUEL USE.

OVER A PERIOD OF TIME WE SHALL PROBABLY SEE A CHANGE IN THE GEAR SHIFT WHICH WILL RESULT IN THE MULTIPLICATION OF SPEEDS WITH THE RESULT THAT A PRACTICE SIMILAR TO THE USE OF A THROTTLE IN STEAM ENGINES WILL FINALLY BE ATTAINED.

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## INCREASING TENDENCY TOWARD USE OF PNEUMATICS

THERE IS AN INCREASING TENDENCY TOWARD THE USE OF PNEUMATIC TIRES. How far this Will be carried will depend solely upon the QUESTION OF THE RELATION BETWEEN THE SAVING IN OPERATING AND ROAD COSTS TO OFFSET THE INCREASE IN THE COST OF CARRIAGE OF THE COM-MODITY.

IN SO FAR AS THE TRUCK IS CONCERNED THERE IS NO TREND TOWARD ANY INCREASE OVER THE PRESENT MAXIMUM SIZE OF 7 1/2 TONS. MANU-FACTURERS HAVE STANDARDIZED ON THIS AS A MAXIMUM AND WHEN THERE IS A DEMAND FOR A GREATER CAPACITY IT WILL UNDOUBTEDLY TAKE THE DIREC-TION OF SEMI-TRAILERS.

WITH RESPECT TO BUS OPERATION IT MAY BE TAKEN AS AXIOMATIC THAT THE MANUFACTURER WILL DO EVERYTHING IN HIS POWER TO ADD TO THEIR RIDING COMFORT. TWO TYPES WILL LARGELY PREVAIL, THE TROLLEY BUS, WHICH WILL BE USED TO CARE FOR MASS TRANSPORTATION AND THE DE LUXE MACHINE WHICH WILL CARE FOR A LIMITED NUMBER OF PASSENGERS AT A MAXIMUM OF COMFORT. SIX WHEELS WILL FREQUENTLY BE USED FOR THE LARGER VEHICLES.

THERE IS NO TREND TOWARD ANY INCREASE OVER THE PRESENT MAX-IMUM WIDTH OF 96 INCHES AND GENERALLY SPEAKING IT WILL BE FOUND THAT THIS TYPE, TOGETHER WITH THE MAXIMUM LOAD TRUCK WILL ONLY BE FOUND IN AREAS OF DENSE POPULATION AND LARGE COMMODITY MOVEMENTS.

THERE IS DEVELOPING AN INCREASING USE OF THE SMALL BUS OF LIGHT WEIGHT AND LIMITED CAPACITY WHICH HAS A LARGE FIELD OF OPERATION BEFORE IT IN FEEDER SERVICE AND IN AREAS WHERE THE TRAFFIC NEEDS WILL ONLY PERMIT OF A MODERATE HIGHWAY DEVELOPMENT FOR MANY YEARS TO COME. \* \* \* \*

VEHICLE DESTINED TO BE TIED INTO OTHER TRANSPORT SYSTEMS

AN OUTSTANDING DEVELOPMENT IN THE PAST YEAR HAS BEEN THE GROWING COORDINATION OF THE MOTOR VEHICLE WITH THE STEAM AND ELECTRIC SYSTEMS OF TRANSPORTATION. TODAY THERE ARE 51 RAILROADS USING MOTOR TRUCKS IN THEIR DISTRIBUTION SYSTEM AND A NUMBER OF OFFICIALS OF OTHER RAILROADS ARE STUDYING WAYS AND MEANS OF USING THE VEHICLE.

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GENERALLY SPEAKING, THE PRACTICE HAS CLEARLY DEMONSTRATED THE SUPERIORITY OF THE FRUCK IN SHORT HAUL MOVEMENTS AND THE RESULT OF THIS TRANSPORTATION HAS BEEN TO GEAR UP MAIN LINE RAIL MOVEMENTS AT A SAVING IN OPERATING COST AS WELL AS AT AN ENHANCEMENT OF SAFETY IN TRAVEL DUE TO THE ELIMINATION OF PEDLAR OR LOCAL FREIGHT TRAIN MOVEMENTS.

IN THE BUS FIELD BOTH STEAM AND ELECTRIC CARRIERS ARE BUILD-ING THE MOTOR VEHICLE INTO THEIR SYSTEMS WITH A RESULTANT SERVICE TO THE PUBLIC OF LARGE CONSEQUENCE FROM THE STANDPOINT OF PUBLIC RELATIONS.

THIS IS A LOGICAL DEVELOPMENT, NO DIFFERENT IN PRINCIPLE FROM THE OTHER TRANSITIONS WHICH HAVE OCCURRED SINCE THE DAYS OF THE STAGECOACH AND CABLE CAR AND IT IS ENTIRELY REASONABLE TO BELIEVE THAT WITHIN A COMPARATIVELY SHORT SPAN OF YEARS THE OLDER TRANSPORTATION CARRIERS WILL OFFER DIFFERENT KINDS OF TRANSPORTA-TION TO THE!R CUSTOMERS JUST AS RETAIL STORES TODAY CARRY DIFFERENT LINES OF MERCHANDISE.

WHAT ARE THE ROAD REQUIREMENTS OF THESE USERS?

WHAT THEN ARE THE ROAD REQUIREMENTS OF THE USERS OF THIS EVER-GROWING BUSINESS OF HIGHWAY TRANSPORTATION? HERE AGAIN TECH-NICAL DETAILS WILL BE AVOIDED BECAUSE THEY LAY OUTSIDE THE FIELD OF THE CAR MANUFACTURER BUT OBSERVATIONS ON THE STATE OF THE MARKET FOR YOUR COMMODITY MAY BE PERTINENT.

FIRST, WHILE THERE HAS BEEN A LARGE INCREASE IN THE MILEAGE OF IMPROVED HIGHWAYS IN THE LAST FIVE YEARS, THE PRIMARY REQUIRE-MENTS ARE NOT MET EVEN YET.

WHEN I TELL YOU THAT PROPERLY SPACED, THE MOTOR VEHICLES WHICH WE HAVE TODAY COVER 122,653 MILES OF ONE-WAY HIGHWAY OR 60,000 of two-way road, and that we are producing at the rate of MORE THAN 9,000 MILES OF VEHICLES EVERY YEAR, IT IS EVIDENT THAT THE ROAD DEVELOPMENT PROGRAM IS FAR FROM A SOLUTION.

THOUSANDS UPON THOUSANDS OF MILES MUST BE OPENED UP TO CARE FOR THE GROWING HOSTS OF MOTOR USERS, AND THOUSANDS OF MILES OF ROAD ALREADY IMPROVED MUST BE WIDENED TO MEET VOLUME REQUIREMENTS OR STRENGTHENED TO MEET THE GROWING TONNAGE NEEDS.

'NEW CITY STREETS MUST BE CUT THROUGH, BY-PASSES CONSTRUCTED, ARTERIAL HIGHWAYS PROVIDED TO CARE FOR THE MOVEMENT IN OR AROUND OUR CITIES.

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(a) A set of the se OVER AND ABOVE THE AVERAGE REQUIREMENTS OF MAIN STATE HIGH-WAYS THERE IS A NEED FOR TERMINAL ROADS WHICH WILL CARE FOR THE HEAVIEST TYPE OF MOVEMENTS IN RESTRICTED METROPOLITAN AND OTHER HEAVY TONNAGE AREAS. \* \* \* \*

WHAT CAN BE DONE TO MEET THE SITUATION?

AN ANALYSIS OF ALL OF THESE NEEDS INDICATES THAT SOME WILL REQUIRE LEGISLATIVE ACTION, OTHERS CAN BE MET, IN PART AT LEAST, BY REGULATION, AND STILL OTHERS ARE QUESTIONS OF CONFERENCE AND PUBLIC RELATIONS.

With respect to legislation, may 1 say that the attitude of the motor car manufacturers can be summed up in a single sentence: "How will this effect our customers?"

THE REASON IS NOT PHILANTHROPIC IN THE NARROW SENSE OF THE WORD. IT IS, IF YOU PLEASE, INTELLIGENT SELFISHNESS.

THOSE WHO LIVE BY MASS PRODUCTION MUST FIND THEIR MARKETS WITH THE MASSES, CONSEQUENTLY, MUST CONSIDER THEIR NEEDS.

SOUND ROAD ADMINISTRATION ELIMINATES WASTE

THE FIRST OBSTACLE WHICH STANDS IN THE WAY OF ECONOMIC USE OF THE MOTOR VEHICLE IS UNIMPROVED HIGHWAYS AND FOR THAT REASON THE CAR MANUFACTURERS HAVE CORDIALLY SUPPORTED ALL SOUND LEGISLA-TION LOOKING TO ROAD IMPROVEMENT.

UNSOUND ROAD IMPROVEMENT, WHETHER IT TAKES THE FORM OF LACK OF PROPER ENGINEERING CONTROL, OF OVER OR UNDER-DEVELOPMENT, OR LACK OF MAINTENANCE, IMMEDIATELY PENALIZES THE CAR OWNER EITHER IN HEIGHTENED TRANSPORTATION COSTS OR AS A TAXPAYER, IN WASTE OF HIS FUNDS.

IT IS IN RECOGNITION OF THIS FACT THAT THE MOTOR MANUFACTURERS STAND SQUARELY BEHIND THE CONTINUANCE OF FEDERAL APPROPRIATIONS AND OF STRONG, CENTRALIZED ENGINEERING AND ECONOMIC CONTROL VESTED IN THE FEDERAL AND STATE GOVERNMENTS.

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DISCRIMINATORY TAXES OPPOSED AS A MATTER OF PRINCIPLE

THE ATTITUDE OF THE MANUFACTURERS TOWARD TAXATION OF THE MOTOR VEHICLE IS JUST AS CLEARLY DEFINED.

THEY ARE OPPOSED TO THE WAR TIME EXCISE TAXES BECAUSE THESE TAXES SINGLE OUT ONE GROUP TO BEAR AN UNDUE SHARE OF A BURDEN WHICH SHOULD BE SHARED EQUALLY BY ALL.

THERE IS AND HAS BEEN NO RELATION BETWEEN THE FEDERAL HIGH-WAY ACT AND MOTOR EXCISE TAXES. THE FIRST WAS PASSED FIRST ON THE GROUND OF COMMON WELFARE. IF IT COULD NOT BE JUSTIFIED ON THAT GROUND ALONE, THEN UNDER THE CONSTITUTION THE FEDERAL GOVERNMENT HAS NO AUTHORITY TO PARTICIPATE IN HIGHWAY IMPROVEMENT.

BUT, THE CONSTITUTION DOES RECOGNIZE THAT RESPONSIBILITY IN UNQUALIFIED LANGUAGE, AND THE PART WHICH THE FEDERAL APPROPRIATIONS, SMALL AS THEY ARE, HAVE PLAYED IN RAISING THE STANDARD OF ROAD WORK IN THIS COUNTRY HAS INSURED THEIR CONTINUANCE AS A MATTER OF TRUE ECONOMY.

IT IS EQUALLY TRUE THAT THE ACTION OF THE HOUSE IN ELIMINAT-ING ALL OF THE MOTOR EXCISE TAXES EXCEPT THAT ON PASSENGER CARS, WHICH HAS BEEN REDUCED, AND THE ACTION OF THE SENATE IN VOTING FOR COMPLETE REPEAL, CONSTITUTES A PRECEDENT FOR THE COMPLETE REPEAL OF THESE LEVIES WHEN AND AS REVENUE NEEDS PERMIT.

SANE REGULATION IS ESSENTIAL TO MOTOR TRAFFIC

SANE REGULATION OF TRAFFIC IS RECOGNIZED BY EVERY ONE AS NECESSARY TO THE SAFE AND EXPEDITIOUS MOVEMENT OF GOODS AND PERSONS ON OUR HIGHWAYS AND THE INDUSTRY ACTING IN CONCERT WITH GOVERNMENT OFFICIALS HAS BEEN THE FIRST TO INSIST UPON DRASTIC PUNISHMENT FOR THOSE WHO IGNORE THE RIGHTS OF OTHERS ON THE ROAD.

THE MANUFACTURERS BELIEVE IN WEIGHT AND SPEED LIMITATIONS PROVIDED BOTH ARE APPLIED WITH A VIEW TO CONSERVING THE PUBLIC INTEREST AND NOT SIMPLY FOR REPRESSIVE PURPOSES.

THEY CONDEMN OVERLOADING OF TRUCKS AND OVER-SPEEDING OF BUSSES, DRIVING WETHOUT PERMIT AND ANY AND ALL PRACTICES WHICH ARE CONTRARY TO THE PUBLIC WELFARE. .

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WITH RESPECT TO THE PROPOSAL THAT THE UNITED STATES GOVERNMENT REGULATE THE COMMON CARRIER IN INTERSTATE COMMERCE, THEY BELIEVE THAT THE BUS SHOULD BE REGULATED AND THEY OPPOSE SIMILAR TREATMENT FOR THE TRUCK.

THE REASON RESTS IN THE SHARP DISSIMILARITY WHICH EXISTS IN THE USE OF THE TWO VEHICLES, AND IN THE FACT THAT WHILE THE BUS IS DISTINCTLY A GROWING ELEMENT IN INTERSTATE MOVEMENT, TRUCK PRACTICE IS TRENDING SHARPLY IN THE OPPOSITE DIRECTION.

THE REASONS CAN BE BRIEFLY STATED.

THE BUS SERVES BEST WHEN IT TRAVELS OVER A FIXED ROUTE BE-TWEEN FIXED TERMINI AT STATED INTERVALS.

THE TRUCK SERVES BEST WHEN IT DOES NEITHER.

IN OTHER WORDS, BUS CARGOS DELIVER THEMSELVES, BUT MOTOR TRUCK CARGOS ARE ONLY HANDLED MOST EXPEDITIOUSLY AND ECONOMICALLY WHEN THE LOAD IS CARRIED FROM SHIPPER'S PLATFORM TO CONSUMER'S GATE. SINCE THESE BOTH VARY, FIXED SCHEDULES RARELY PERMIT OF A FULLY ECONOMIC OPERATION.

SHIPPER CAN BUY TRUCK, PASSENGER WON'T BUY BUS

THERE IS ANOTHER AND SALIENT POINT OF DIFFERENCE.

THE THEORY OF TRANSPORTATION REGULATION HAS ALWAYS BEEN PUNITIVE.

WHILE BUS FRANCHISES MUST BE LIMITED IF THE PUBLIC IS TO RE-CEIVE THE SERVICE IT DEMANDS AND CONSEQUENTLY JURISDICTION MUST OB-TAIN OVER FARES AND ROUTES, THERE IS NO PARALLEL HERE WITH TRUCK SERVICE.

THE PASSENGER WON'T BUY A BUS IF RATES ARE UNREASONABLE OR SCHEDULES IMPROPERLY MAINTAINED.

BUT THE SHIPPER, UNLIKE THE RAILROAD SHIPPER, HAS A PUBLIC ROAD AT HIS SERVICE AND HE CAN GO OUT AND BUY A TRUCK IF RATES BECOME UNREASONABLE.

OR HE CAN USE A CONTRACT CARRIER WHICH THE SUPREME COURT HAS RULED ARE NOT COMMON CARRIERS. .

CONSEQUENTLY, THERE IS NO "LIKELIHOOD OF THE MOTOR TRUCK EVER SETTING UP A MONOPOLY CONTRARY TO THE PUBLIC INTEREST.

COMMON CARRIER PRACTICALLY NON-EXISTENT IN TRUCK FIELD

FINALLY, IT IS A FACT, BORNE OUT BY THE STUDIES OF THE BUREAU OF PUBLIC ROADS, THAT COMMON CARRIER MOTOR TRUCK LINES TEND TO DECREASE RATHER THAN TO GROW IN NUMBER.

A SUPPLEMENTARY INDEX STUDY WHICH WE HAVE JUST MADE PENDING MORE EXHAUSTIVE SURVEYS BY THE GOVERNMENT INDICATES THE TRUTH OF THIS CONCLUSIVELY.

IN SEVERAL STATES WHERE THERE ARE TENS OF THOUSANDS OF MOTOR TRUCKS IN OPERATION, THE COMMON CARRIER LINES NUMBER BUT FROM TEN TO FIFTY, USING LESS THAN A TOTAL OF ONE HUNDRED TRUCKS.

WHEN AN ANALYSIS IS MADE OF THE PERCENTAGE OF THESE CROSSING STATE LINES THE FIGURE APPROACHES ZERO.

ANY ATTEMPT TO CHECK THE USE OF THE TRUCK AS A COMMON CARRIER BY THE ENACTMENT OF OPPRESSIVE TAXATION OR REGULATION SIMPLY RESULTS IN TRANSFER TO ANOTHER AND MORE FAVORED LEGAL STATUS AND THE TONNAGE CARRIED IS NOT AFFECTED.

UNFAIR TAXATION WILL NOT BE TOLERATED BY USERS

THERE ARE THOSE WHO INSIST THAT THE TRUCK IS NOT PAYING ITS WAY. THERE ARE CASES WHERE IT SHOULD PAY MORE THAN IT DOES, BUT IN THE MAIN, THE VEHICLE IS DOING ITS PART.

THOSE WHO THINK IT CAN BE MADE TO PAY MORE THAN A FAIR SHARE SHOULD MAKE AN ANALYSIS OF THE OWNERSHIP OF THESE VEHICLES. IN THE MAIN THEY BELONG TO LARGE MANUFACTURERS, PRODUCERS AND DISTRIBUTORS WHO PAY A VERY LARGE PROPORTION OF THE TAXES.

THAT THEY WILL PERMIT THEMSELVES TO BE DEPRIVED OF THE SERVICES OF AN ARTICLE WHICH IS PRACTICALLY INDISPENSABLE IN MODERN BUSINESS IS UNTHINKABLE NOR WILL THE CONSUMERS WHO EVENTUALLY PAY THE COST OF MATERIALS HAULED IN THESE VEHICLES, REST CONTENT IF THEIR LIVING COSTS ARE UNFAIRLY AFFECTED.

SHOULD PAY REASONABLE SHARE OF HIGHWAY COSTS

ON THE OTHER HAND, LET IT BE NOTED THAT THE MANUFACTURERS HOLD NO BRIEF AGAINST FAIR TAXATION OF ANY MOTOR VEHICLE SO LONG AS THE FUNDS SO LEVIED GO INTO ROAD PURPOSES. .

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A FAIR TAX ON THE MOTOR VEHICLE WHEN APPLIED TO ROAD USES PRODUCES A SPECIAL BENEFIT IN THE FORM OF LOWERED TRANSPORTATION COSTS.

THAT THE MOTOR VEHICLE USERS WHO CONSTITUTE IN THEMSELVES A MAJORITY OF THE VOTING POWER OF THE COUNTRY, HAVE ACCEPTED THIS PRINCIPLE IS BEST EVIDENCED BY THE FACT THAT THE TAXES NOW PAID BY THEM ABOUT OFFSET THE ENTIRE CURRENT TAX BURDEN FOR CONSTRUCTION AND MAINTENANCE OF ALL OF THE HIGHWAYS OF THE COUNTRY:

THE MONEY THEY PAY DOES NOT ALWAYS GO INTO THE ROAD IT IS TRUE, BUT THEIR DOLLARS OFFSET OTHERS AND THE RESULT IS THE SAME.

CONFERENCE BEST MEDIUM FOR CLEARING UP CONTROVERSIES

ASIDE FROM THOSE QUESTIONS WHICH REQUIRE LEGAL ACTION, THERE ARE MANY CONTROVERSIAL POINTS WHICH HAVE LENT THEMSELVES TO SETTLE-MENT BY CONFERENCE.

T HAS BEEN THE PLEASURE OF THE MOTOR CAR MANUFACTURERS TO PARTICIPATE IN MANY SUCH DISCUSSIONS WITH THE HIGHWAY OFFICIALS AND THE RESULTS HAVE GREATLY INURED TO THE PUBLIC GOOD.

THE JOINT HIGHWAY TRANSPORT COMMITTEE MADE UP OF REPRESENT-ATIVES OF THE NATIONAL AUTOMOBILE CHAMBER OF COMMERCE, THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS AND THE BUREAU OF PUBLIC ROADS HAS BEEN ABLE TO SETTLE MANY DOUBTFUL QUESTIONS.

IN THESE MEETINGS THE ADVICE OF NON-PARTISAN ECONOMISTS, OF BANKERS AND OF FARMERS, HAS BEEN SOUGHT AND IN THIS WAY PRINCIPLES HAVE BEEN ARRIVED AT WHICH HAVE MET WITH THE UNANIMOUS ENDORSEMENT OF THE PUBLIC GENERALLY. \* \* \* \*

DECISION OF THE COMPTROLLER GENERAL

## CONTRIBUTED BY THE LEGAL SECTION

A DECISION OF CONSIDERABLE INTEREST WAS RENDERED BY THE COMPTROLLER GENERAL OF THE UNITED STATES ON FEBRUARY 2, 1926. THE FOREST SERVICE HAD SUBMITTED A QUESTION CONCERNING THE USE OF FUNDS PROVIDED FOR CARRYING OUT THE PROVISIONS OF SECTION 23 OF THE FEDERAL HIGHWAY ACT. IT WAS DESIRED TO CONSTRUCT TWO BUILDINGS ON GOVERNMENT LAND IMMEDIATELY ADJACENT TO THE PAYETTE NATIONAL FOREST, IDAHO, FOR THE STORAGE AND REPAIR OF TOOLS AND EQUIPMENT USED IN THE MAINTENANCE OF ROADS AND TRAILS IN THAT FOREST. THE COMPTROLLER GENERAL DECIDED THAT, IN THE ABSENCE OF SPECIFIC STATUTORY AUTHORITY, THE APPROPRIATIONS MADE FOR CARRYING OUT THE PROVISIONS OF SECTION 23 OF THE FEDERAL HIGHWAY ACT WERE NOT AVAILABLE FOR THE CONSTRUCTION OF THE BUILDINGS PROFOSED.

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## CONTROL OF THE ZIG ZAG RIVER ON THE MOUNT HOOD LOOP IN OREGON

COMPLLED BY THE DIVISION OF CONSTRUCTION FROM A SPECIAL REPORT SUBMITTED BY W. G. PETERS, ASSOCIATE HIGHWAY ENGINEER OF District 1.

A system of concrete piers connected by steel cables has been used successfully to prevent the overflow of a portion of the Zig Zag River paralleling the M<sub>0</sub>unt Hood Loop Road in Oregon. This work was completed in October 1923. In 1921, when the road was first constructed, some log cribbing was built about 800 feet above the Zig Zag River bridge with the intention of retaining the flow of the water within the existing stream bed. This type of construction was unsuccessful. In January, 1923, the flood flow of the river was unusually high with the existing and the bridge. One summer cottage was washed away, a portion of the grade was destroyed and bowlders were left in a mass on the road.

TO INSURE AGAINST SIMILAR DAMAGE IN THE FUTURE IT WAS DECIDED TO CONSTRUCT ALONG THE LOW BANK OF THE STREAM A SYSTEM OF CONCRETE PIERS CONNECTED BY A SERIES OF CABLES. THIS WORK WAS DONE IN OCTOBER, 1923. AFTER COMPLETION BRUSH AND DEBRIS WERE PILED AGAINST AND INTERWOVEN BETWEEN THE CABLES TO BEGIN THE COLLECTION OF DRIFT DURING FUTURE HIGH WATER, AND THUS BUILD UP A BARRIER TO THE FLOW. FIGURES 1 AND 2 SHOW THE PIERS, CABLES AND DEBRIS IN DETAIL.

DURING THE FLOOD STAGE, THIS RIVER CARRIES A LARGE AMOUNT OF SILT, SAND AND GRAVEL, IN ADDITION TO BRUSH, LOGS AND OTHER DEBRIS. BY USING THE PIERS AND CABLES TO CATCH THIS DEBRIS AT THE THREATENED PART OF THE SANK, THE FLOW OF WATER IS STOPPED TO SUCH AN EXTENT THAT THE SEDIMENT IS DEPOSITED ALONG WITH THE FLOATING MATTER. THE BRUSH AND LOGS, COMBINED WITH THE SAND AND GRAVEL, NATURALLY BUILD UP A MATTED SAR OF INTERLOCKED MATERIALS, PROGRESSING WITH THE RISING OF THE WATER.

The Largest pier was placed adjacent to the bridge abutment. It was 9 feet 10-1/2 inches square at the top and 16 feet 9 inches Square at the bottom, with an average height of 11 feet 2 inches and a difference in height of 4 feet 4 inches between the high and Low corners. It contained 75 cubic yards of concrete. The pier at the upper end of the barrier - 440 feet distant - and the inter-Mediate piers were smaller. The upper pier, also square, Measured 8 feet 4-1/2 inches at the top and 14 feet 9 inches at the bottom, Had an average height of 10 feet 9-1/2 inches, and contained 60 cubic yards of concrete. The eight intermediate piers were 3 feet 9 inches square on top and 10 feet 9 inches on a side at the base

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FIGURE 1. - CLOSE-UP OF ONE OF THE PIERS WITH THE STEEL CABLES EMBEDDED IN THE CONCRETE. THE WOODEN POST SPREADERS HOLD THE CAELES IN THE PROPER POSITION.



FIGURE 2. - THE PIERS WERE PLACED WITH THE HIGHEST CORNERS FARTHEST FROM THE CENTER LINE OF THE STREAM.



WITH AN AVERAGE HEIGHT OF 9 FEET 9 INCHES AND A CUBIC CONTENT OF 23.5 CUBIC YARDS.

THE FIVE LINES OF 1-1/4-INCH GALVANIZED WIRE CABLE WERE SPACED ONE FOOT APART, THE BOTTOM ONE TWO FEET ABOVE THE GROUND. TWO 6 BY 6-INCH BY 6-FOOT FIR SPREADERS BETWEEN EACH PAIR OF PIERS MAINTAINED THE SPACING.

CONCRETE WAS MACHINE MIXED IN THE PROPORTION OF 1:3:6 AND AS MANY BOWLDERS AS POSSIBLE WERE USED WITHOUT LEAVING VOIDS. THE PIERS WERE PUT DOWN TO A GOOD FOUNDATION, AND PROJECTED ABOVE THE GROUND ABOUT SEVEN OR EIGHT FEET.

A TOTAL OF \$5,087.50 WAS SPENT FOR LABOR, MATERIALS AND ENGINEERING IN CONNECTION WITH THE WORK OF PLACING THE TOTAL OF 323 CUBIC YARDS OF CONCRETE IN THE PIERS, THE COST BEING DIVIDED AS FOLLOWS:

<u>I TEM</u>	LABOR	MATERIAL Supplies	TOTAL
CLEAR ING	\$ 11.86	\$ 2.36	\$ 14.22
EXCAVATION	81.11	15.70	96.81
PLANT INSTALLATION		2.10	2.10
FORMS	486.24	203.94	690.18
CABLE INSTALLATION	102.89	1,111.37	1,214.26
CONCRETE	774.49	1,664.09	2,438.58
EQUIPMENT RENTAL		631.15	631.15
TOTALS	\$1,456.59	\$3,630.71	\$5,087.30

THIS GIVES A COST OF \$15.75 PER CUBIC YARD FOR CONCRETE.

PRORATED ENGINEERING AND MISCELLANEOUS CHARGES ARE INCLUDED IN THE ABOVE AS FOLLOWS:

ITEM	LABOR	MATERIAL SUPPLIES	TOTAL
M:SCELLANEOUS Engineering	\$287.19 102.23	\$357.65 <u>36.82</u> \$394.47	\$644.84 <u>139.05</u>

THIS WORK WAS DONE BY BUREAU FORCES.



## NEW PROJECT STATEMENT FORM INCREASES LENGTH OF PROJECTS

### CONTRIBUTED BY THE DIVISION OF DESIGN

ONE OF THE REASONS FOR ADOPTING THE NEW PROJECT STATEMENT FORM IN 1923 WAS TO OBTAIN LONGER FEDERAL-AID HIGHWAY PROJECTS. STATISTICS RECENTLY COMPILED CLEARLY INDICATE THAT THE PURPOSE IS BEING SUCCESSFULLY ACCOMPLISHED.

FROM SEPTEMBER, 1916, TO DECEMBER 31, 1923, THE NUMBER OF PROJECT STATEMENTS RECEIVED BY THE BUREAU AND APPROVED BY THE SECRETARY OF AGRICULTURE WAS 7,498. THESE PROVIDED FOR 64,311 MILES OF HIGHWAY IMPROVEMENTS. THE AVERAGE NUMBER OF PROJECT STATEMENTS APPROVED EACH YEAR DURING THIS PERIOD WAS 1,071. AN ANALYSIS INDICATES THAT THE AVERAGE MILEAGE PER PROJECT STATEMENT PER YEAR VARIED FROM 11.1 MILES IN 1917 TO 7.3 MILES IN 1921, OR AN AVERAGE OF 8.5 MILES FOR THE PERIOD EXTENDING FROM 1916 TO 1923.

THE NEW PROJECT STATEMENT FORM WAS IN GENERAL USE BY ALL THE STATES IN JANUARY, 1924. FROM THIS DATE TO JANUARY 1, 1926, THE TOTAL NUMBER OF PROJECT STATEMENTS APPROVED WAS 1,929. THESE PROVIDED FOR THE IMPROVEMENT OF 40,968 MILES OF HIGHWAYS. DURING THIS PERIOD, THE NUMBER OF APPROVED PROJECTS AVERAGED 964 PER YEAR AND THE AVERAGE MILEAGE PER PROJECT STATEMENT PER YEAR WAS 22.3 MILES. THE ANALYSIS OF THE STATISTICS FOR THE TWO PERIODS INDI-CATES THAT WITH THE NEW FORM THE AVERAGE NUMBER OF PROJECT STATE-MENTS PER YEAR HAS BEEN REDUCED BY 107, WHILE THE AVERAGE LENGTH PER PROJECT HAS BEEN INCREASED BY 13.8 MILES.

THE STATISTICS SHOW THAT A TOTAL OF 9,427 PROJECT STATEMENTS HAD BEEN APPROVED TO JANUARY 1, 1926. THEY PROVIDED FOR 105,279 MILES OF FEDERAL-AID HIGHWAY IMPROVEMENTS, AND REPRESENT A TOTAL ESTIMATED COST OF \$1,985,562,203.90. OF THIS AMOUNT, 3,572 MILES OF HIGHWAY, REPRESENTING A TOTAL COST OF \$23,173,628.00, ARE NOT ON THE APPROVED FEDERAL-AID HIGHWAY SYSTEM, BUT WERE ON THE POST ROADS IN THE SEVERAL STATES. THE MILEAGE INVOLVED IN THE APPROVED PROJECT STATEMENTS IS APPROXIMATELY 52 PER CENT OF THE MILEAGE ON THE FEDERAL-AID HIGHWAY SYSTEM AND APPROXIMATELY 3.7 PER CENT OF THE CERTIFIED MILEAGE OF THE UNITED STATES.

THE NUMBER OF PROJECT STATEMENTS APPROVED EACH YEAR FROM 1916 to 1925, Inclusive, Varied from 221 in 1917 to 1,536 in 1920. The average number approved was 1,047 per year. The mileage involved in the project statements varied from 0.5 to 153.0 miles. The average length per project was 11.1 miles and the average Estmated cost was \$18,860.00 per mile.

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GRAPH-SHOWING THE INCREASE IN THE PERCENTAGES OF CONSTRUCTION INSPECTIONS AND MATERIAL TESTS WITH A CORRESPONDING DECREASE IN OVERHEAD EXPENSES IN DISTRICT 6 DURING THE FISCAL YEARS 1925 AND 1926. THE COST OF NEW AUTOMOBILES IS NOT INCLUDED IN THE OVERHEAD EXPENSE.





GRAPH-SHOWING THE INCREASE IN THE PERCENTAGES OF CONSTRUCTION INSPECTIONS AND MATERIAL TESTS WITH A CORRESPONDING DECREASE IN OVERHEAD EXPENSES IN DISTRICT 6 DURING THE FISCAL YEARS 1925 AND 1926. THE COST OF NEW AUTOMOBILES IS NOT INCLUDED IN THE OVERHEAD EXPENSE.



## BUREAU GALIBRATING BRICK RATTLER TEST FOR BRICK OF VARIOUS THICKNESSES

As an outgrowth of the experiments now being conducted by the Bureau at Arlington, Virginia, to determine the relative value of paving brick of various thicknesses, the Bureau is now Making Rattler tests on the brick of the several thicknesses supplied for the test. The object is to determine what correct on factors should be applied to the specification requirements for bricks of standard thickness, to allow for the difference in thickness.

As the brick supplied for the Arlington test through the Courtesy of the American Paving Brick Manufacturers' Association are of practically uniform quality, it is assumed that the amount of Loss obtained in the rattler test on samples of each thickness compared with the loss when standard 3-1/2 by 4 by 8-1/2 inch brick are used Will permit the establishment of the desired correction factors for thicknesses of 2, 2-1/2, 3 and 4 inches respectively. The brick secured for the Arlington test are comparatively hard. The rattler tests will be made on all thicknesses of the brick, and Will be repeated on the same thicknesses of a softer brick of uniform quality.

THE RESULTS OF THE TESTS WILL BE USED AS THE BASIS FOR A PAPER TO BE PRESENTED TO THE FORTHCOMING ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR "ESTING MATERIALS.

## RESEARCH APPLIED TO BRIDGE DESIGN

THE VALUE OF RESEARCH IS INDICATED BY RECENT TRENDS IN BRIDGE DESIGN. SINCE THE PUBLICATION OF THE BRIDGE IMPACT STUDIES BY THE IOWA STATE COLLEGE EXPERIMENT STATION IN COOPERATION WITH THE IOWA STATE HIGHWAY COMMISSION AND THE BUREAU, THERE HAS BEEN A GENERAL REVISION OF THE SPECIFICATION FOR IMPACT ALLOWANCE WHERE THE FORMER ALLOWANCE WAS INADEQUATE. IN SOME CASES PROVISION IS NOW MADE FOR IMPACT WHERE FORMERLY NONE WAS MADE.

INVESTIGATIONS ON THE PROTECTION OF CONCRETE AGAINST ALKALI BY THE BUREAU HAVE NOW REACHED A POINT WHERE THE RESULTS CAN BE APPLIED TO CONSTRUCTION. THE BUREAU HAS RECENTLY RECOMMENDED THAT A PROTECTIVE TREATMENT BE GIVEN CONCRETE FOR USE IN SALT AND ALKALI WATER, THE METHOD OF TREATMENT TO BE ALONG THE LINES INDICATED BY THE RESEARCH REPORT "PROTECTION OF CONCRETE AGAINST ALKALI" PRINTED IN THE JANUARY ISSUE OF PUBLIC ROADS.

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UNITED STATES DEPARTMENT OF AGRICULTURE BUREAU OF PUBLIC ROADS

TABLE P-1 (1926)

EST IMATED PROGRAM OF STATE AND LOCAL EXPENDITURES.

True         (Function)         Description         Control         Contro         Control         Control	Tot         Cannot         Cannot <th></th> <th>GRAND TOTAL EXPENDITURES</th> <th>Ряо</th> <th>BABLE EXPENDITUR</th> <th>ES BY STATE HIGHWA</th> <th>IV DEPARTMENTS</th> <th></th> <th>EXPENDITURES</th> <th>EST I WATE CONSTRUC</th> <th>ED ROAD N STED BY S</th> <th>ILEAGE T.</th> <th>O BE Depts.</th> <th>MILES</th> <th></th>		GRAND TOTAL EXPENDITURES	Ряо	BABLE EXPENDITUR	ES BY STATE HIGHWA	IV DEPARTMENTS		EXPENDITURES	EST I WATE CONSTRUC	ED ROAD N STED BY S	ILEAGE T.	O BE Depts.	MILES	
Time         Description         Descripion <thdescription< th=""> <thdes< th=""><th>Tri         Control         Low         Tri         Control         Low         &lt;</th><th>STATES</th><th>( ESTIMATED )</th><th>CONSTRUCT IDN</th><th></th><th>COR CONSTRUCTION</th><th></th><th>For</th><th>ON RDADS AND</th><th></th><th></th><th>AND- A</th><th>BPHALT</th><th>ED BY</th><th>STATES</th></thdes<></thdescription<>	Tri         Control         Low         <	STATES	( ESTIMATED )	CONSTRUCT IDN		COR CONSTRUCTION		For	ON RDADS AND			AND- A	BPHALT	ED BY	STATES
Monten         1         0 <th>unime         1         0<th></th><th>ON STATE AND Local Roads</th><th>AND Mai ntevance</th><th>TOTAL</th><th>Roads</th><th>BRIDGES</th><th>MAINTENANCE</th><th>URIDGES SY LO- Cal Authorities</th><th>TDTAL</th><th>RATH M- Moved N</th><th>RAVELA</th><th>ONCRETE AND BRICK D</th><th>отате Нісниач Дерт.</th><th></th></th>	unime         1         0 <th></th> <th>ON STATE AND Local Roads</th> <th>AND Mai ntevance</th> <th>TOTAL</th> <th>Roads</th> <th>BRIDGES</th> <th>MAINTENANCE</th> <th>URIDGES SY LO- Cal Authorities</th> <th>TDTAL</th> <th>RATH M- Moved N</th> <th>RAVELA</th> <th>ONCRETE AND BRICK D</th> <th>отате Нісниач Дерт.</th> <th></th>		ON STATE AND Local Roads	AND Mai ntevance	TOTAL	Roads	BRIDGES	MAINTENANCE	URIDGES SY LO- Cal Authorities	TDTAL	RATH M- Moved N	RAVELA	ONCRETE AND BRICK D	отате Нісниач Дерт.	
Constrain         C, SAG100         C, SAG100 <thc, sag100<="" th="">         C, SAG100         <thc, sag100<="" th="">         C, SAG100         <thc, sag100<="" th=""> <thc, sag100<="" th=""> <thc,< td=""><td>Control         Control         <t< td=""><td>ALABAMA</td><td>\$ 21,900,000</td><td>\$ 9,900,000</td><td>\$ 9,300,000</td><td>\$ 9,000,000</td><td>\$ 300,000</td><td>\$ 600<b>,</b>000</td><td>\$ 12,000,000</td><td>613</td><td>,</td><td>490</td><td>123</td><td>1750</td><td>ALABAMA</td></t<></td></thc,<></thc,></thc,></thc,></thc,>	Control         Control <t< td=""><td>ALABAMA</td><td>\$ 21,900,000</td><td>\$ 9,900,000</td><td>\$ 9,300,000</td><td>\$ 9,000,000</td><td>\$ 300,000</td><td>\$ 600<b>,</b>000</td><td>\$ 12,000,000</td><td>613</td><td>,</td><td>490</td><td>123</td><td>1750</td><td>ALABAMA</td></t<>	ALABAMA	\$ 21,900,000	\$ 9,900,000	\$ 9,300,000	\$ 9,000,000	\$ 300,000	\$ 600 <b>,</b> 000	\$ 12,000,000	613	,	490	123	1750	ALABAMA
Control         17,0000         16,0000         5,0000         1,00000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         100000         1000000         100000         10000000         10000000         10000000         1000000000000000000000000000000000000	meres         15,00,00         10,00,00         5,00,00         10,00,00         500,00         10,00,00         1	ARI ZONA	4,830,000	4,200,000	3, 500,000	3,200,000	300,000	100,000	630,000	147	40	9	2	1607	ARIZONA
Observation         10.560.00         17.560.00         17.45.60         2000.00         17.4         18.7         19.7         <	Optimize         0.550/00         0.500/00	CAL LEDAN LA	15,500,000	6, 500, 000	E,000,000	4,000,000	1,000,000	1,500,000 F FOD DOD	9,000,000	930 250	200	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 2	6000	ARKANBAS California
Description         1.9.54/56         7.19/56         7.00000         2.00000         1.01	Operation         1 0.0000         1 0.0000         2 0.0000         1 0.0000         2 0.0000         1 0.0000         2 0.0000         1 0.0000         0 0.0000000         0 0.0000         0 0.0000	COLORADO	9,550,000	4,550,000	3,972,500	3,972,500	1/1	577,500	5,000,000	2/195	303	93	32	8642	COLORADO
Charate         3,300,10         2,300,10         2,370,10	United         3 95000         2 95000 <th< td=""><td>CONNECT I CUT</td><td>10,285,289</td><td>7,785,239</td><td>4,785,239</td><td>3,000,000</td><td>1,785,289</td><td>3,000,000</td><td>2,500,000</td><td>113</td><td></td><td>8</td><td>33</td><td>1872</td><td>CDNNECT I CUT</td></th<>	CONNECT I CUT	10,285,289	7,785,239	4,785,239	3,000,000	1,785,289	3,000,000	2,500,000	113		8	33	1872	CDNNECT I CUT
Control         R M m M m M m M m M m M m M m M m M m M	Control         Control <t< td=""><td>DELAWARE</td><td>3,830,000</td><td>2,930,000</td><td>2,770,000</td><td>2,000,000</td><td>170,000</td><td>160,000</td><td>800,000</td><td>70</td><td></td><td></td><td>22</td><td>200</td><td>OELAWARE</td></t<>	DELAWARE	3,830,000	2,930,000	2,770,000	2,000,000	170,000	160,000	800,000	70			22	200	OELAWARE
Mer         0.0800         0.080000         0.080000         0.080000	Officitie         Control         Contro         Control         Control         <	FLOR IDA	32,000,152	14,000,152	13,197,152	13, 187, 152	1/	803,000	18,000,000	440	3/ 70	5/ 170 3	200	1624	FLDR 1DA
Unite         Error         Error <th< td=""><td>United       ####################################</td><td>LOAND</td><td>20,324,750</td><td>7,324,750</td><td>5,624,750</td><td>5,024,750</td><td>600,000</td><td>1,700,000</td><td>13,000,000</td><td>442 205</td><td>160</td><td>164</td><td>118</td><td>624B</td><td>GEDRGIA</td></th<>	United       ####################################	LOAND	20,324,750	7,324,750	5,624,750	5,024,750	600,000	1,700,000	13,000,000	442 205	160	164	118	624B	GEDRGIA
District	District         Strend         Transmin         Strend         Str	11 INOTS	ee 200 /000	2000 000 av			2 000 000				010	1 D	0001		
Max         556/10         956/10 <td>Res         55/10/10         15/6/10         15/6/10         50/11/6         5</td> <td>NC I ANA</td> <td>53.200.000</td> <td>13,200,000</td> <td>10,000,000</td> <td>8,760,000</td> <td>1,250,000</td> <td>3,200,000</td> <td>40,000,000</td> <td>280</td> <td>2</td> <td>ע. ע.</td> <td>225</td> <td>4218</td> <td>INDIANA</td>	Res         55/10/10         15/6/10         15/6/10         50/11/6         5	NC I ANA	53.200.000	13,200,000	10,000,000	8,760,000	1,250,000	3,200,000	40,000,000	280	2	ע. ע.	225	4218	INDIANA
Meters         1007000         1007000         10000000         10000000         10000000         1000000000000000000000000000000000000	Meter         1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	I OVIA	29.534.108	13.584.108	9.994.108	8.071.144	1.922,964	3, 590, 000	16.000.000	1248	521	704	23	6674	Iowa
Kerter         2.00.000         1.50.000         1.675.000         1.7	Metricity         2:00:00         1:0:0:00:00         1:0:0:00:00	KANBAB	19,072,000	9,072,000	7,072,000	F, 000, 000	2,072,000	2,000,000	10,000,000	595	300	200	с б	2000	Kansas
ULI IMA         I (2.34)         3 (2.30)         0 (2.34)	Unit         1         2         2         0         2         0	KENTUCKY	22,000,000	12,000,000	10,250,000	10,250,000	-	1,750,000	10,000,000	434	237	139	58	2500	KENTUCKY
Mixed         15.343.40         5.43.40         7.53.44.40         7.53.44.40         7.53.44.40	Minter Biologie         15/36/36         16/36/36	LDU ISI ANA	16.250.000	9.250,000	7.000.000	6.000.000	1.000.000	2,250,000	7,000,000	<b>5</b> 00	÷	425	75	4200	LOUISIANA
Biological Interview         Spring Interv	нателистия         2000000         1100000         12000000         1200000         1200000	MAINE	12, 383, 400	8,983,400	6,483,400	5,383,400 2 750 000	1,100,000	2,500,000	3,900,000	422	1	336	9 C	4900	MATVE
Operation         53.000000         11.00000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.0000000         1.00000000         1.00000000         1.00000000         1.00000000         1.000000000000000000000000000000000000	Operation         33300000         1130000         13000000         13000000         13000000	MARY LAND	9E 000 000	111111111111111111111111111111111111111	3,450,000			3, F00, 320	2, 200,000	02-0	•	20	0.4		MARYLAND
Winderständ         23,000,00         21,000,00         5,000,00         1,000,00	Wittering         22,000,00         51,000,00         50,000 <t< td=""><td>MICH IG AN</td><td>33, 500,000</td><td>11.500.000</td><td>A. 500,000</td><td>7,000,000</td><td>1.500.000</td><td>1 FUU UUU</td><td>22,000,000</td><td>400</td><td>75</td><td>201</td><td>225</td><td>7000</td><td>MASSACHUSETTS</td></t<>	MICH IG AN	33, 500,000	11.500.000	A. 500,000	7,000,000	1.500.000	1 FUU UUU	22,000,000	400	75	201	225	7000	MASSACHUSETTS
Unserent         0.757:000         5.75:000         7.75:0000         7.75:000         7.75:000	Unstant         0755000         575000         575000         1500000         1500	MINNESOTA	28,000,000	21.500.000	15,000,000	14 500,000	FOD. DOD		E EDD. DOD	2682	1242	1250	100	18000	MINNEDITA
40.75.00         3.00.700         5.700.00         1.700.000         1	Museuri         - 0.017.00         - 1.000.00	MISSISSIPPI	12,250,000	6,250,000	5,000,000	3,250,000	1,750,000	1,250,000	6,000,000	320	00	180	2 22	3300	MI 85185 1001
MARKA         Z. 360,000         I. 300,000         I. 300,000 </td <td>Artistical         2,350,000         1,500,000</td> <td>MISSOURI</td> <td>40,07E,000</td> <td>28,076,000</td> <td>26,000,000</td> <td>24,100,000</td> <td>1,900,000</td> <td>2,076,000</td> <td>12,000,000</td> <td>1500</td> <td>500</td> <td>350</td> <td>650</td> <td>7640</td> <td>MISSOURI</td>	Artistical         2,350,000         1,500,000	MISSOURI	40,07E,000	28,076,000	26,000,000	24,100,000	1,900,000	2,076,000	12,000,000	1500	500	350	650	7640	MISSOURI
Remember         2.000.000         1.570.000         1.700.000 <th< td=""><td>Method         F. Scholling         F. Scholling</td><td>VICT ANA</td><td>2,350,000</td><td>1,350,000</td><td>1,200,000</td><td>1,000,000</td><td>200,000</td><td>2 260 200</td><td>1,000,000</td><td>125</td><td>22</td><td>001</td><td></td><td>0001</td><td>MONT ANA</td></th<>	Method         F. Scholling	VICT ANA	2,350,000	1,350,000	1,200,000	1,000,000	200,000	2 260 200	1,000,000	125	22	001		0001	MONT ANA
Wei fürst         5,00,000         3,50,000         1,50,000	Mericina         5,000,000         3,550,000         1,500,000 <th< td=""><td>NE BHABKA Ne vada</td><td>2,070,000</td><td>1.670.000</td><td>4,500,000</td><td>4,000,000</td><td>500,000</td><td>2,000,000</td><td>8, 500,000</td><td>1230</td><td>400</td><td>800</td><td>2 2 2</td><td>1050</td><td>NEBRASKA</td></th<>	NE BHABKA Ne vada	2,070,000	1.670.000	4,500,000	4,000,000	500,000	2,000,000	8, 500,000	1230	400	800	2 2 2	1050	NEBRASKA
CHE MERT         31:00:000         25:00:000         19:40:000         16:40:000         20:00:000 <t< td=""><td>Let         31/200/200         5/200/200         1/2/20/200         5/200/200         1/2/20/200         5/200/200         1/2/20/200</td><td>VEW HAMPSHIRE</td><td>E.050.000</td><td>3.550.000</td><td>1.550.000</td><td>1.500.000</td><td>50,000</td><td>2.000.000</td><td>1.500.000</td><td>101</td><td>, ,</td><td>10</td><td>σ</td><td></td><td>NEW HANDEN IDE</td></t<>	Let         31/200/200         5/200/200         1/2/20/200         5/200/200         1/2/20/200         5/200/200         1/2/20/200	VEW HAMPSHIRE	E.050.000	3.550.000	1.550.000	1.500.000	50,000	2.000.000	1.500.000	101	, ,	10	σ		NEW HANDEN IDE
Werkling Werklin	Werking wervictuot         3,755,653         3,555,553         2,633,307         2,630,000         7,50,00	NEW JERSEY	31,200,000	22,900,000	18,400,000	16,400,000	2,000,000	4, 500,000	3, 300, 000	311	,	190	112	3913	NEW JERBEY
Wert Variet         F2,351,000         57,750,000         57,750,000         57,750,000         57,750,000         57,750,000         57,750,000         77,750,000         77,750,000         77,750,000         77,750,000         77,750,000         77,750,000         77,750,000         77,000         770,000         77	Mercel         F2.35(.000)         55.765(.000)         72.765(.000)	NEW MEXICD	3,755,553	3, 555, 553	2,993,053	2,539,397	453,656	F62, F00	200,000	146	44	93	σ	4500	NEW VEXICO
Мани Лонски, в 5:00,000         15,00,000         17,00,000         17,00,000         17,00,000         17,00,000         17,00,000         17,00,000         17,00,000         17,00,000         17,000         100	Wert Machun         56,000,000         15,00	NEW YORK	F2,391,000	35,750,000	19,250,000	17,250,000	2,000,000	16, 500,000	26,641,000	534	52	24	458	9100	NEW YORK
March March         Constrained         Constrained <thconstrained< th=""> <thconstrained< th=""></thconstrained<></thconstrained<>	Martine         Exp. Nov	NORTH CAROLINA	26,000,000	16,000,000	12,000,000	12,000,000	تۇر	4,000,000	10,000,000	728	304	180	244	6200	NORTH CAROLINA
Останим         2::00:000         5::00:000 <th< td=""><td>Outward         Zar,000,00         Family (0,000,00)         Family (0,</td><td>OHIO</td><td>00,350,000</td><td>D, 450, 000</td><td>5,000,000</td><td>3, 200,000</td><td>1, 500,000</td><td>450,000</td><td>3, 500,000</td><td>1380</td><td><u></u></td><td>020</td><td>•</td><td>00/2</td><td>NDRTH UAKOTA</td></th<>	Outward         Zar,000,00         Family (0,000,00)         Family (0,	OHIO	00,350,000	D, 450, 000	5,000,000	3, 200,000	1, 500,000	450,000	3, 500,000	1380	<u></u>	020	•	00/2	NDRTH UAKOTA
Decent         11,000,000         7,000,000         3,500,000         1,500,000 <th< td=""><td>Reference         1,000,000         7,000,000         <t< td=""><td>OKL AHDMA</td><td>22.000.000</td><td>10,000,000</td><td></td><td>F 250 000</td><td>2,000,000</td><td>a, 500,000</td><td></td><td></td><td>2.5</td><td></td><td></td><td>econ E ECON</td><td>OH10 DKI AHDMA</td></t<></td></th<>	Reference         1,000,000         7,000,000 <t< td=""><td>OKL AHDMA</td><td>22.000.000</td><td>10,000,000</td><td></td><td>F 250 000</td><td>2,000,000</td><td>a, 500,000</td><td></td><td></td><td>2.5</td><td></td><td></td><td>econ E ECON</td><td>OH10 DKI AHDMA</td></t<>	OKL AHDMA	22.000.000	10,000,000		F 250 000	2,000,000	a, 500,000			2.5			econ E ECON	OH10 DKI AHDMA
Privatival         TG.050,000         53:55,000         53:95,000	FEWARTANIA         TG.050         E3.550.000         E3.550.000         E3.750.000         E3.750.000<	OREGON	14,000,000	7,000,000	4,000,000	3, 500,000	500,000	3,000,000	7,000,000	285	150	125	20	3000	OREGON
Model Istando         4,655,000         5,70,000         5,70,000         5,70,000         5,70,000         5,70,000         5,70,000         5,70,000         5,70,000         7,70,000	Mode         5,250,000         3,190,000         3,190,000         3,190,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         5,110,000         1,100,000         1,1	PENVEVLVANIA	76.050.000	63,550,000	49, 300,000	47,800,000	2,000,000	13,750,000	12,500,000	1100		240	960	10823	PENNSYLVANIA
Offer         3,750,000         5,750,000         2,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         5,750,000         7,	Date         Date <th< td=""><td>SPUTH CAPOLINA</td><td>4,665,000</td><td>3,750,000</td><td>3,190,000</td><td>3,000,000</td><td>120,000</td><td>600,000</td><td>875,000</td><td>5</td><td>1 0</td><td>36</td><td>56</td><td>406</td><td>RHODE ISLAND</td></th<>	SPUTH CAPOLINA	4,665,000	3,750,000	3,190,000	3,000,000	120,000	600,000	875,000	5	1 0	36	56	406	RHODE ISLAND
Tenne         27,000,000         1,000,000         1,755,000         1,556,50         1,37,33         3,754,500         1,566,50         1,37,33         3,754,500         1,566,50         1,37,33         3,754,500         1,270,000         1,270         1,000,000         1,270         1,200         1,000         1,270         1,200         1,000         1,270         1,200         1,000         1,270         1,200         1,000         1,270         1,200         1,000         1,270         1,200         <	Envirence         2:30:000         1:30:00         1:30:00	SPUTH DAKOTA	8 600 000	3, 240,000	3, 240,000	3, 190,000	250,000		2,500,000			- 9	5	404	SOUTH CAROLINA
TEAB         44,000,000         28,000,000         20,000,000         19,000,000         19,000,000         19,000,000         19,000,000         19,000,000         10,000 <th10< td=""><td>Terms         44,000,000         28,000,000         15,000,000         15,000,000         15,000,000         15,000         1500</td><td><b>TENNESSEE</b></td><td>27.000.000</td><td>18.000.000</td><td>14,735,350</td><td>13, 596, 562</td><td>1,133,733</td><td>3.264,650</td><td>e.000.000</td><td>1359</td><td>393</td><td>334</td><td>132</td><td>4000</td><td>TENVEBSEE</td></th10<>	Terms         44,000,000         28,000,000         15,000,000         15,000,000         15,000,000         15,000         1500	<b>TENNESSEE</b>	27.000.000	18.000.000	14,735,350	13, 596, 562	1,133,733	3.264,650	e.000.000	1359	393	334	132	4000	TENVEBSEE
Unternation         4,140,798         3,560,798         3,170,753         2,463,703         5,260,000         1,750,000         2,160,000         2,110,753         2,110,753         2,110,753         2,110,753         2,110,753         2,110,753         2,220         Vermin         2,220         Vermin         2,230         Vermin         2,320         Vermin         2,300         Vermin         3,100,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,750,000         1,770,000         1,770,000         1,770,000	Unterner         4,140,798         3,170,793         2,461,793         2,461,793         2,461,793         2,461,793         3,170,793         2,461,793         2,461,793         2,461,793         2,461,793         2,470,000         1,720,000         2,720         Uternet         2,230,000         1,740,793         2,461,793         2,461,793         2,401,000         1,720,000         1,740,000         2,230,000         1,740,793         2,401,000         1,720,000         1,740,000         1,740,000         2,230         0         2,230         0         2,230         0         2,230         0         1,740,000         1,770,000         1,770,000         1,770,000         1,770,000         1,770,000         1,770,000         1,770,000         1,770,000 <th< td=""><td>TEXAB</td><td>44,000,000</td><td>28,000,000</td><td>20,000,000</td><td>18,000,000</td><td>2,000,000</td><td>3,000,000</td><td>15,000,000</td><td>1250</td><td>600</td><td>500</td><td>150</td><td>1 8000</td><td>TEXAS</td></th<>	TEXAB	44,000,000	28,000,000	20,000,000	18,000,000	2,000,000	3,000,000	15,000,000	1250	600	500	150	1 8000	TEXAS
VIRGINIA         12.351.00         5.351.00         7.350.00         7.350.00         7.350.00         7.360.000         7.34.582         7.71.153.1582 <th7< td=""><td>VIGUNIA         1,350,00         1,350,00         1,350,00         1,350,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200,000         1,750,00         1,750,000         1,770,000         1,770,000</td><td>VERMONT</td><td>4,140,798</td><td>3,640,793</td><td>3,170,758</td><td>2,363,793</td><td>302,000</td><td>470,000</td><td>E00,000</td><td>528</td><td>1</td><td>228</td><td></td><td>3200</td><td>UTAH</td></th7<>	VIGUNIA         1,350,00         1,350,00         1,350,00         1,350,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200         1,300,00         2,325,00         7,200,000         1,750,00         1,750,000         1,770,000         1,770,000	VERMONT	4,140,798	3,640,793	3,170,758	2,363,793	302,000	470,000	E00,000	528	1	228		3200	UTAH
Makington         20,000,000         7,250,000         7,250,000         1,350,000         1,750,000         1,750,000         1,750,000         1,750,000         422         300         42         3000         Makington           Vest Virginia         10,750,000         13,750,000         11,120,000         893,000         1,750,000         1,750,000         260         42         300         42         300         455         4set Virginia           Wisconsin         31,670,000         15,750,000         11,120,000         21,750,000         1,750,000         2550         20         42         300         45         367         4set Virginia           Wisconsin         31,670,000         15,600,000         1,600,000         1,750,000         10,700,000         2550         20         20         260         42         360         Wisconsin           Wowing         31,670,000         1,600,000         1,750,000         10,700,000         150         70         260         1000         260         42         361         2751         234,582         701 155         431,556         200         413,526         70         260         700         26,00         10,700         70         26,01         70         26,00	Makington         20,000,000         7,250,000         7,250,000         1,350,000         1,750,000         1,750,000         1,750,000         1,750,000         422         300         42         3000         Makington           Vest Virginia         10,750,000         13,750,000         11,120,000         893,000         1,750,000         1,750,000         705         301         263         141         2152         AEET Virginia           Wisconsin         31,670,000         15,750,000         11,120,000         2,000,000         1,750,000         10,700,000         2550         200         42         300         Wisconsin           Wisconsin         31,670,000         1,600,000         1,600,000         1,760,000         1,750,000         10,700,000         2550         200         42         300         260         100         10050         100,000         10,700         2550         70         700         260,000         10,700         10,700         10,700         10,700         260         100         000         10,700         10,700         10,700         260         100         260         100         10050         100         10050         110,000         150         215         214,152         210         200<	VIRGINIA	12.335.500	10.285.500	7.460.000	F. 881,000	500°,000	2.825.500	600,000	212	42	000	- C2	0582	VERMONT
Meet Virginia         15,750,000         13,750,000         12,000,000         11,120,000         830,000         1,750,000         6,000,000         705         301         263         141         2152         Neet Virginia           Wisconsin         31,670,000         15,000         1,600,000         1,600,000         2550         -         2100         260         10050         Wisconsin           Wowing         31,670,000         1,600,000         1,600,000         1,600,000         1,600,000         2550         -         2100         260         Wooning           Wowing         31,00,000         1,600,000         1,600,000         1,600,000         1,600,000         150         70         260         1000         Woming           Wowing         31,00,000         1,600,000         1,600,000         1,700,000         150         70         200         250         200         280         290         241,515         281,515,400         8,41,515,600         10,700         29,216         8,145         14,320         6,751         234,582         707LS         8         431,656,000         2,000         241,515         280         534,582         707LS         8         14,1,030,286         280         50,516 <t< td=""><td>Meet Virginia         15,750,000         13,750,000         12,000,000         11,120,000         830,000         1,750,000         1,750,000         263         141         2152         4eet Virginia           Wieconsin         31,670,000         15,670,000         1,600,000         1,760,000         1,750,000         2550         -         2100         260         10000         Wieconsin           Wieconsin         31,670,000         1,600,000         1,600,000         1,600,000         1,600,000         2560         -0         2100         2000         260         Wieconsin           Wowing         31,670,000         1,600,000         1,600,000         1,600,000         1,600,000         16,751         283         100         260         1000         260         200         260         200         260         260         260         260         263         11         2153         284         1000         2750         70         283         700         270         263         70         270         270         270         271         234,582         70141S         284         10155         101         70         283         7014S         284         7014S         284         7014S         284</td><td>VASH INGT ON</td><td>20,000,000</td><td>9,000,000</td><td>7,250,000</td><td>E,400,000</td><td>1,350,000</td><td>1,750,000</td><td>11,000,000</td><td>462</td><td>220</td><td>200</td><td>42</td><td>3000</td><td>WASH INGTON</td></t<>	Meet Virginia         15,750,000         13,750,000         12,000,000         11,120,000         830,000         1,750,000         1,750,000         263         141         2152         4eet Virginia           Wieconsin         31,670,000         15,670,000         1,600,000         1,760,000         1,750,000         2550         -         2100         260         10000         Wieconsin           Wieconsin         31,670,000         1,600,000         1,600,000         1,600,000         1,600,000         2560         -0         2100         2000         260         Wieconsin           Wowing         31,670,000         1,600,000         1,600,000         1,600,000         1,600,000         16,751         283         100         260         1000         260         200         260         200         260         260         260         260         263         11         2153         284         1000         2750         70         283         700         270         263         70         270         270         270         271         234,582         70141S         284         10155         101         70         283         7014S         284         7014S         284         7014S         284	VASH INGT ON	20,000,000	9,000,000	7,250,000	E,400,000	1,350,000	1,750,000	11,000,000	462	220	200	42	3000	WASH INGTON
Misconsin       31,670,000       16,70,000       16,600,000       14,600,000       14,600,000       14,600,000       16,000       160       2350       -       2100       270       700       70       800       100       70       400       100       70       400       100       70       800       100       70       200       100       200       100       200       100       200       400	Misconsin       J1,670,000       T6,600,000       T4,600,000       T4,600,000       T4,600,000       T000       Wisconsin         T01ALS       #10.30.286.948       \$ 588.590.943       \$ 458.515.400       \$ 413.916.703       \$ 47.593.687       \$ 137.075.544       \$ 431.626.000       29.145       14.320       £ 751       234.582       T01ALS         REMARKS       Asove data Reported by State Highway Departments of Resective States.       \$ 47.593.687       \$ 137.075.544       \$ 431.626.000       29.026       £ 751       234.582       T01ALS         REMARKS       Asove data Reported by State Highway Departments of Resective States.       \$ 137.075.544       \$ 431.626.000       29.216       8.145       14.320	WEST VIRGINIA	12,750,000	13,750,000	12,000,000	11,120,000	830,000	1,750,000	6,000,000	705	301	263	141	2152	AEBT VIRGINIA
TOTALS       #1.030.286,948       \$ 598,590.943       \$ 461,515,400       \$ 413,916,703       \$ 47,593,697       \$ 137,075,548       \$ 431,656,000       29,216       8,145       14,320       6,751       234,582       TOTALS         REMARKS:       ABOVE DATA REPORTED BY STATE HIGHWAY DEPARTMENTS OF RESECTIVE STATES.       NOTES:       J       APPRDXIMATE DETAILS.       3       A7,593,697       \$ 137,075,548       \$ 431,656,000       29,216       8,145       14,320       6,751       234,582       TOTALS         REMARKS:       ABOVE DATA REPORTED BY STATE HIGHWAY DEPARTMENTS OF RESECTIVE STATES.       NOTES:       J       APPRDXIMATE DETAILS.       234,582       TOTALS	TOTALS 1.030.236,948 \$ 598,590,943 \$461,515,400 \$ 413,916,703 \$ 47,593,697 \$ 137,075,544 \$ 431,556,000 29,216 8,145 14,320 6,751 234,582 TOTALS REMARKS: ABOVE DATA REPORTED BY STATE HIGHWAY DEPARTMENTS OF REPECTIVE STATES. NOTES: 1/ BRIGGE EXPENDITURES INCLUDED WITH ROAD EXPENDITURES 2/ ONLY WILEAGE OF FEDERAL AID ROADS GIVEN. 3/ APPRDXIMATE DETAILS.	WYOMING	31,670,000	20,970,000	16, 500, 000	14,600,000	2,000,000	4,370,000	000,000	2350	- 20	2100	2	00001	WIECONBIN
TOTALS #1.030.236,948 \$ 599,590,943 \$461,515,400 \$ 413,916,703 \$ 47,593,697 \$ 137,075,544 \$ 431,526,000 29,216 8,145 14,320 6,751 234,582 TOTALS REMARKS: Above data reported by State Highway Departments of Reference states. NOTES: 1/ Bridge expenditures included with road expenditures 2/ Only vileage of Federal aid Roads given. 3/ Approximate details.	TOTALS F1.030.236,948 \$ 599,590,943 \$461,515,400 \$ 413,916,703 \$ 47,593,697 \$ 137,075,544 \$ 431,556,000 29,216 8,145 14,320 6,751 234,582 TOTALS REMARKS: Above data reported by State Highway Departments of Resective States. NOTES: 1/ BRIGGE EXPENDITURES INCLUDED WITH ROAD EXPENDITURES 2/ ONLY VILEAGE OF FEDERAL AID ROADS GIVEN. 3/ APPRDXIMATE DETAILS.			C I FOOTOOO			-1	000°000	000 002	2	2	3	1	2000	MA OM I NG
REMARKS: Above data reported by State Highway Departments of respective states. NOTES: 1/ Bridge expenditures included with road expenditures 2/ Only wileage of Federal aid roads given. 3/ Approximate details.	REMARKS: Above data reported by State Highway Departments of respective states. NOTES: 1/ Brigge expenditures included with road expenditures 2/ Only wileage of Federal aid Roads given. 3/ Approximate details.	TOTALS	11,030,236,948	\$ 598,590,943	\$461, 515, 400	\$ 413,916,703	\$ 47,593,697	\$ 137,075,548	\$ 431,696,000	29,216	8,145	14,320	E.751	234,582	TOTALS
memanns: Above data reported by State Highway Departments of respective states. NOTES: 1/ Bridge expenditures included with road expenditures 2/ Only wileage of Federal aid roads given. 3/ Approximate details.	MEMARKAS: ABOVE DATA REPORTED BY STATE HIGHWAY DEPARTMENTS OF REGRECTIVE STATES. NOTES: 1/ BRIGGE EXPENDITURES INCLUDED WITH ROAD EXPENDITURES 2/ ONLY WILEAGE OF FEDERAL AID ROADS GIVEN. 3/ APPRDXIMATE DETAILS.										-				
NOTES: 1/ BRIGGE EXPENDITURES INCLUDED WITH ROAD EXPENDITURES 2/ ONLY WILEAGE OF FEDERAL AID ROADS GIVEN. 3/ APPRDXIMATE DETAILS.	NOTES: 1/ BRIGGE EXPENDITURES INCLUDED WITH ROAD EXPENDITURES 2/ ONLY WILEAGE OF FEDERAL AID ROADS GIVEN. 3/ APPRDXIMATE DETAILS.	NEMANNO: NEG	VE DATA REPORTED	BY STATE HIGHWAY	DEPARTMENTS OF	RESPECTIVE STATES.									
		NOTES: 1/	BRIDGE EXPENDITUR	ES INCLUDED WITH	ROAD EXPENDITUR	18 2/ ONLY WILEA	GE OF FEDERAL A	ID ROADS GIVEN.	3/ APPRDXIMAT	E DETAILS					

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THE BUREAU IS ALSO NOW RECOMMENDING IN MANY CASES THAT CON-CRETE FLOOR BE ADOPTED ON BRIDGES IN PREFERENCE TO TIMBER. COMPARA-TIVE COST STUDIES ON A NUMBER OF PROPOSED PROJECTS HAVE SHOWN THE DIFFERENCE IN COST TO BE SO SMALL AS TO MAKE THE LESS DURABLE TYPE UNECONOMICAL.

## FEDERAL RADIO AND TELEGRAPH SERVICE

THE RADIO AND TELEGRAPH SERVICES OF THE WAR DEPARTMENT ARE NOW AVAILABLE TO THE FIELD OFFICES OF ALL FEDERAL DEPARTMENTS AND THE CHIEF COORDINATOR AT WASHINGTON, D. C., HAS URGED THAT THESE MESSAGES BE TRANSMITTED BY COOPERATION WITH THE ARMY SIGNAL CORPS.

THE FOLLOWING POINTS ARE REACHED BY WAR AND NAVY DEPARTMENT LEASED WIRES:

WASHINGTON, D. C.	PHILADELPHIA, PA.	BOSTON, MASS.
BALTIMORE, MD.	New York, N. Y.	Portsmouth, N. H.
ABERDEEN, MD.	NEW LONDON, CONN.	Norfolk, VA.
EDGEWOOD, MD.	NEWPORT, R. I.	Portsmouth, Va.
ALSO A SHORT	LINE FROM BROWNSVILLE TO	Laredo, Texas.

RADIO NETS OF THE WAR AND NAVY DEPARTMENTS CONNECT THE FOLLOWING POINTS IN THE UNITED STATES:

Aberdeen, Md.	BOSTON, MASS.	CHEYENNE, WYO.
ASTORIA, ORE.	BROWNSVILLE, TEX.	CHICAGO, ILL.
ATLANTA, GA.	BURLINGTON, VT.	Columbus, O.
BALTIMORE, MD.	Chattanooga, Tenn.	CUMBERLAND, MD.
BIRMINGHAM, ALA.	CHARLESTON, S. C.	Dallas, Tex.
DAYTON, O.	Los Angeles, Cal.	Omaha, Nebr.
Denver, Colo.	MARFA, TEX.	Pensacola, Fla.
Des Moines, la.	MIDDLETOWN, PA.	Portland, Ore.
DETROIT, MICH.	MINNEAPOLIS, MINN.	SALT LAKE CITY, UTAH.
Edgewood, Md.	MITCHELL FIELD, N.Y.	San Antonio, Tex.
EL PASO, TEXAS.	MONTGOMERY, ALA.	SAN DIEGO, CAL.
FORT BRADY, MICH.	Muskogee, Okla.	SAN FRANCISCO, CAL.
GREAT LAKES, ILL.	NEW LONDON, CONN.	Savannah, Ga.
INDIANAPOLIS, IND.	NEW ORLEANS, LA.	SEATTLE, WASH.
KANSAS CITY, MO.	NEWPORT, R. I.	ST. Louis, Mo.
KEY WEST, FLA.	NEW YORK, N. Y.	ST. PAUL, MINN.
LAREDO, TEX.	NOGALES, ARIZ.	UNIONTOWN, PA.
LEAVENWORTH, KANS.	NORFOLK, VA.	WASHINGTON, D. C.

THE NAVY RADIO ALSO REACHES ALL OUR INSULAR POSSESSIONS AND MANY FOREIGN COUNTRIES.

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THE WAR DEPARTMENT IS ANXIOUS TO DEVELOP THIS SERVICE TO THE FULLEST EXTENT BOTH IN THE INTEREST OF ECONOMY AND IN ORDER TO TRAIN AN EFFICIENT PERSONNEL FOR USE IN AN EMERGENCY.

THERE HAS BEEN SOME COMPLAINT BY THE DISTRICT OFFICES THAT MESSAGES ARE OCCASIONALLY EITHER NOT DELIVERED OR ELSE TRANSMITTED INACCURATELY. IT SHOULD BE REMEMBERED THAT THE COMMERCIAL COMPANIES ALSO MAKE ERRORS AND THAT THEIR PRESENT EFFICIENCY HAS BEEN REACHED ONLY AFTER CONSIDERABLE EXPERIENCE. IT IS BELIEVED THAT THE FACILITIES OF THE SIGNAL CORPS WILL IMPROVE RAPIDLY AS THE FEDERAL DEPARTMENTS TAKE ADVANTAGE OF THIS FREE SERVICE.

IT IS APPARENT THAT THE SYSTEMS MUST BE USED INTELLIGENTLY, OTHERWISE THE PURPOSE IS DEFEATED, NO ECONOMY IS EFFECTED, AND THE GOVERNMENT FACILITIES ARE UNNECESSARILY BURDENED. IT IS NOT CLAIMED THAT THE GOVERNMENT SYSTEMS CAN RIVAL OR ENTIRELY REPLACE THE GREAT COMMERCIAL SYSTEMS, THEY CAN, HOWEVER, BE USED TO GREAT ADVANTAGE AND ECONOMY BETWEEN POINTS AT WHICH GOVERNMENT COMMUNI-CATION OFFICES ARE LOCATED AND IN MANY CASES IN WHICH THE LONG TRANSMISSION IS MADE OVER GOVERNMENT FACILITIES AND ONLY A SHORT RELAY IS INVOLVED OVER A COMMERICAL LINE.

DISTRICT ENGINEERS OF THE BUREAU MAY DETERMINE WHETHER IT IS ADVISABLE TO USE THIS SERVICE BY GETTING IN TOUCH WITH THE NEAREST RADIO TERMINAL AND FINDING THE COST OF THE COMMERICAL TELEPHONE RELAY OF THE MESSAGE TO THE DISTRICT OFFICE. IN THE EVENT THAT THE SERVICE IS CONSIDERED DESIRABLE, SPECIFIC ARRANGEMENTS SHOULD BE MADE FOR THE TRANSMISSION OR DELIVERY OF MESSAGES. IT IS EVIDENT THAT FOR COADT TO COAST TRANSMISSION A GREAT SAVING IN TIME 'CAN BE EFFECTED BY THE USE OF THE FEDERAL RADIO AS COMPARED WITH THE EXISTING SPECIAL DELIVERY OR AIR MAIL SERVICES OF THE POST OFFICE DEPARTMENT.

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- F. A A - I u. 29, '26 - A		STATES		ALABAMA ARIZDNA ARKAMSAS	CALIFORNIA COLORADO CONNECTICUT	OELAWARE FLORIDA GEORGIA	10AHO ILLINOIS INGIANA	10 WA KANSAS KENTUCKY	LOUISIANA Maine Maryland	MASSACHUSETT5 MICHIGAN MINNESOTA	MISSISSIPPI MISSOURI MONTANA	NEBRASKA NEVAOA NEW HAMPSHIRE	NEW JERSEY NEW MEXICO NEW YORK	NORTH CAROLINA NORTH DAKOTA OHIO	OKLAHOMA OREGON PENNSYLVANIA	RHODE ISLANO SOUTH CAROLINA SOUTH DANGTA	TENNESSEE TEXAS UTAH	VERMONT VIRGINIA WASHINGTON	WEST VIRGINIA' WISCONSIN WYOMING	HAWAII	TOTALS
α 		GE D BY VEER	MILES	11.6 8.1 28.6	42.4 42.5 0.1	10.5 57.4 101.2	16.7	66.4 223.0 19.7	43.1	13.8 27.9 47.4	118.0 59.7 10.6	57.0 2.6	3.6 21.0 14.2	9.2 98.1 54.6	8.9 17.3 79.2	66.3	71.2 195.0 3.3	73.7	47.9 0.1		
	TS COLUMN 2)	P.S.&E. STA RECOMMENDED DISTRICT ENGI	FEDERAL AID	280.705.04 71.187.67 179.465.83	430, 015, 59 312, 161, 41 7, 907, 95	9, 000, 00 612, 330, 58 713, 203, 69	369,673,50 19,274,56 22,529,01	459,644,10 981,325,27 820,213,32	270,779.53	245, 485, 27 515, 992, 73 230, 000, 00	913,581.90 1.129.002.60 91.850.45	454,466.05 48,073,56 968,22	54,405,00 264,051,04 212,700,00	258,702.13 386,802.09 617,050.32	471, 863.47 334,409.24 1.043,176.40	692,951.08 77,991.69	1.077.923.04 2.043.973.95 121.442.60	7.532.72 1.374.274.53 115.000.00	546.407.00 8.766.09		
	PROJEC	TAGE	MILES	323.3 107.6 376.5	309.5 217.8 32.2	22.7 251.8 631.3	157.6 250.9 503.6	589. C 255. C	142.9 65.1 35.1	83.2 241.4 512.8	363.3 667.6 224.3	111648 338.4 20.0	52.8 100.7 726.6	214.4 495.1 271.6	283.7 165.0 660.4	29.9 343.5 624.1	247.6 1098.6 255.2	28.4 170.5 27.6	172.2 230.3 166.2	6.5	
	6 LOTMENTS TO	AGREEMENT S	FEDERAL AID	\$ 3,219,109,72 864,577.01 2,828,222,73	5,454,469.96 2,144,111.22 645,129,68	388,784.75 4,37(,709.60 4,840,789.55	1,371,569,57 3,570,836,90 8,662,550,22	3, 736, 952, 24 3, 917, 319, 49 3, 217, 321, 02	1.629.454.53 780.452.22 389.675.27	1.626.906.60 4.306.703.96 2.326.300.00	3.675,140.35 2.004,969.98 1.4ê0,044.72	5, F08, 171, C4 2, C87, 21C, 26 308, 223, 80	3, C49, 655, 72 755, 043, 53 11, 397, 519, 74	3.707.026.35 1.909,317.33 3,437.110.04	2,717,489,98 1,545,336,57 9,666,654,06	474,795.67 2,845,652,53 1,874,089,82	3.172.540.12 7,760,313.80 2,094,023.08	541.827.36 2.269,813.50 1.117,400.00	2.527.091.71 2.315.907.42 1.715.249.44	97.440.00	
	ALI		MILES	1134.4 706.0 1249.8	976.6 692.9 115.0	119.4 96.3 1695.2	673.3 1300.2 469.2	2033.4 1096.3 677.2	996.5 300.7 399.0	321.3 91-1- 3118.2	992 C	1690.9 512.4 235.7	254+2 1410-9 1041+7	1209.5 2166.3 1358.5	993.2 874.7 947.4	95.3 1306.0 1975.8	677.2 4682.2 436.4	129.2 944.5 663.9	364.2 1519.3 1127.4		
TION FUNDS		COMPLETE AND PAIO	FEDERAL AID	\$ 7.377.089.43 5.652.823.21 7.064.326.42	12.046,269.50 6.598.016.60 2.069.580.80	1.703.735.60 1.405.437.97 11.070,951.45	5,461,144.09 19,572,697.59 7,136,275.22	11,427,859.05 11,821,954.65 7,506,695.52	5,783,405,72 4,154,972,23 4,220,995.20	5,743,017,39 11,111,322,30 14,023,616,65	6,137,464.28 11,UL4,2' 4.03 6,235, 47.88	5,126,316.75 4,639,145.04 2,347,501.90	4, 4C2.033,45 7,424,012-10 15,555,839,80	10,140,364.63 5.914.773.59 17.275,217.28	11,100,271,61 9,071,065,28 17,731,322,43	1,51८,229,30 5,599,038,49 7,912,499,92	9.270.611.66 26,816.339.17 4.150.343.77	1.906.763.17 9.580.993.65 7.726.109.46	3,634,873.30 9,642,219.39 5,819,734,05		100 100 10
OF AGRICULTURE ROADS CONSTRUC	CE OF	NMENTS NDT YET PLACED UNDER	(COLUMN 1-3 ]	\$ 3,807.983.54 3,136,811.81 1,775.434.76	4,249,411.33 3,409,375,11 1,673,340,52	376.637.65 1.760.911.43 1.964.147.79	1,606.7 <i>9</i> 7.20 6.669.339.96 2.591.500.02	4,449,136,36 3,543,475,23 2,343,220,37	1,583.769.17 1,565.506.37 705,496.53	2.773,200.94 4.599.382.06 2.122,963.44	1, 327, 408, 16 2,310, 932, 87 6,173, 224, 77	4.0.51.949.74 1.020.086.14 517.787.74	961.275.23 2,772.032.13 3,924,975.46	2.040.494.84 3.016.122.37 5.072.326.33	1,480,927,45 1,245,225,49 4,052,298,10	630.545.13 245,502.74 1,302.209.57	2,136,095,49 6,371,666,92 1,482,909,10	912.383.75 1.620,143.44 1,199,266.54	1,224,502.78 5.101.909.20 1,040.873.42	1,002,713.00	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
states gepartment ureau of public <b>VL AID ROAD</b> as of . fearlyry (	BALAN	APPURITO NDT ALLDTTED TO PROJECTS	(COLUMN 1-2 )	3.472.470.81 3.028.661.11 1.534.789.02	4,142,059,95 3,271,522,77 1,611,062,57	367,537,65 1,605,325,85 1,807,009,31	1,357,239,84 6,669,339,96 2,332,990,55	3.711,103.61 2.743.811.59 2.269.579.14	1,539,769,17 1,51°,403,55 705,430,53	2,472,916,74 4,410,775,33 2,011,963,44	1,401,830,37 1,650,361,33 5,647,361,95	3,546,231.16 1,020,096,14 512,732,18	961,275,83 2.725,274,23 6, 279,135,46	1,610.512.99 2,537,765.99 4,402,418.36	1,770,161.90 925,455.91 2,835,528.11	644 . 242. 13 - 73. 221. 24 1. 3. 2 202. 67	1.759.516.18 4.935.904.08 1.452,969.55	912,383,75 270,327,32 1,189,266,54	1.090,545.99 4.334.381.20 1.022.525.42	1.002.713.00	
UNITEO B 5 OF FEDER/	4	PAID TO STATES		<ul> <li>9,536,800.87</li> <li>6,150,645.37</li> <li>9,748,068,99</li> </ul>	15,147.047.91 7,737.616.60 2,283.683.42	1,893,347.53 4,557,955,70 14,549,337.25	6.423.684.71 22.336.516.00 13.323.362.74	13,506,611,42 14,271,831,69 9,566,7333.36	6,758,117,45 4,145,460,46 4,964,164,01	6, 161, 999, 54 14, 229, 305, 73 16, 702, 013, 95	9, 744, 211. 58 16, 723, 742, 57 6, 735, 341, 11	3,463,744.57 7,229,339.12 2,449,011.00	6,235,404,85 7,543,397.07 20,101,638,44	12.357,993.91 6,665,963.71 18,974.367.92	13,107,337,28 9,022,233,09 24,590,203,01	1, 512, 223, 30 7, 610, 350, 90 9, 089, 083, 69	11, 558, 591,06 30,240,379,86 6,656,644,33	2,104,912,48 10,791,856-66 7,875,417,56	5,113,942,20 10,597,428.71 7,073,530.35	5ù,467 <b>.</b> 50	0400 000 011 10
STATUS		TION	MILES	1452.7 795.0 1617.5	1324.5 933.7 144.1	142.1 391.3 2395.3	930.6 1553.6 360.1	2544.5 1603.4 320.1	1182.5 361.1 434.1	401.4 1166.3 364C.5	1394.2 2016.8 1162.2	2776+5 853.4 255+2	310.6 1527.2 1645.7	1401.6 2618.6 1627.1	1269.5 1014.1 1594.9	115.2 1684.9 2599.9	923.4 5739.0 700.8	157.6 1112.9 691.5	525.1 1730.9 1293.5	6.5	
	e	PLACED UNCONSTRUC	FEDERAL AID	<pre>\$ 10.541,471.46 6,490.437.19 9,830.365.24</pre>	17,823.403.67 8.915.836.89 2.669,840.40	2.097,520.35 6.324.042.57 16.467.805.21	5, 352, 829, 80 23,162, 309, 04 15,614, 854, 39	15,036,427,64 15,930,935,72 10,364,533,63	7,683,638,83 4,999,321,63 5,219,550,47	7.330,525.06 15.752,922.54 17.46,915,56	10.300,609.84 20.463,503.13 7,251,660.23	10,601,286.26 7,775,128,86 2,651,704,26	7.506.144.17 8.200.353.87 25.120.215.54	13,676,711,16 7,732,536.63 20,659,459.67	14,178,859,55 9,654,121,51 27,295,782,90	1,987,023.87 8,956,021.26 9,864,581.43	13,144,495,51 34,234,754,05 6,335,963-90	2.456,123.25 11,891.370.56 8,957,509.46	6,128,009,22 12,336,905,90 7,525,400,58	37,440.00	A 243 000 100 40
		N 6 S)	MILES	1469.3 821.7 1654.9	1330.5 953.2 147.9	152.6 405.5 2428.4	347.6 1553.6 972.8	· 2638.8 1786.3 992.1	11.92.5 355.8 434.1	418.3 1193.5 3678.4	1473. 8 2064. 4 1272. 5	2864.7 853.4 255.7	310.6 1532.6 1782.5	1433, 1 2749, 6 1684, 6	1275.8 1061.0 1547.0	115.2 1717.8 2599.9	996.0 5865.8 700.9	157.6 1193.7 691.5	526.4 1797.5 1293.7	5.5	06930 C
	ALLOTTE	10 PROJEC (SEE COLUM FOR DETAIL	FEDERAL AIO	\$ 10,876,984.19 6,558,587.99 10,071,014.98	17,930,755.05 9,054,239,23 2,722,616,43	2,106,520.35 6,339,123.15 16,624,944.69	7.202,387.16 23,162,909.04 15,921.364.45	15,774,454.39 15,720,599.41 10,944,229.86	7,633,633,93 ,4,945,424,45 5,213,560,47	7. F15. 809.26 15, 931, 559, 67 17, 579, 916.56	10,726,137.03 21,136,074,61 7,777,523,05	11, 049, 453, 84 7, 775, 128, 96 2, 656, 693, 32	7,506,144.17 9,247.111.77 27,166.059.54	14,106,693.01 8,210,893.01 21,329,377,64	14,299,625,06 9,950,861.09 28,503.152.89	1, 947, C23, 87 9, 127, 542, 10 9, 864, 591, 43	13,521.074.82 35,620,626.92 6,365,309.45	2.456.123.25 13,225,136.58 8.957,509.45	6,201,965.01 12,504,433.30 7,543,748.58	97 <b>,</b> 44C. 00	10 10 010 010 0
		FROM JULY 11,1916 TO DATE		\$ 14,349,455.00 9,617,249,00 11,605,804,00	22,072,815.00 12,325,812.00 4,333,681.00	2,474, U58.00 8,064,954.00 19,431,953.00	8,559,627,00 29,832,198,00 18,204,355,00	19,485,5 <b>63</b> ,00 19,464,411,00 13,212,809,00	9.272.408.00 6.464.328.00 5.925.057.00	10,103,726,00 20,342,265,00 15,591,790,00	12.129,013.00 22.736,436.00 13.424,835.00	14,635,235,0 8,795,215,00 3,169,432,00	3,467,420,0X 10,972,395,00 34,045,195,00	15,717,206,00 10,743,653,00 26,731,796,00	16.059,787.00 10.879,347.00 31.333,751.00	2.657.569.00 9.361.524.00 11.166.750.00	15,280,591,00 40,606,431-00 7,318,773,00	3,268,507.00 13,501,514.00 10,145,776,00	7,352,511,00 17,433,915,00 9,566,274,00	1,100,153.00	10 - 10 - 10 - 10
		STATES		ALABAMA ARIZONA ARKANSAS	CALIFORNIA COLORA OO CONNECTICUT	DELAWARE FLORIDA GEORGIA	I DAHO I LLINOIS I NOIANA	IOWA Kansas Kentucky	LOUISIANA MAINE MARYLANO	MASSACHUSETTS MICHIGAN MINNESOTA	MISSISSIPPI MISSOURI MONTANA	NEBRASKA NEVADA NEW HAMPSHIRE	NEW JERSEY NEW MEXICO NEW YORK	NORTH CAROLINA NORTH OAKOTA OHIO	OKLAHOMA OREGON PENNSYLVANIA	RHODE ISLAND SOUTH CAROLINA SOUTH DAKOTA	TENNESSEE TEXAS UTAH	VERMONT VIRGINIA WASHINGTON	WEST VIRGINIA WISCONSIN WYOMING	HAWAII	TOTALS



## PROGRESS OF FEDERAL HIGHWAY LEGISLATION

H. R. 8264 - Passed by the House on February 2, 1926.

PASSED BY THE SENATE WITH AMENDMENTS ON FEBRUARY 27, 1926.

- Makes appropriations for the Department of Agriculture for the fiscal year ending June 30, 1927, and for other purposes.
- \$5,000,000 is appropriated for forest roads and trails of which \$3,725,000 is part of the \$7,500,000 authorized for the fiscal year 1,926 and the balance - \$1,275,000 - is appropriated for the fiscal year 1927.
- \$75,000,000 is appropriated for Federal-aid Roads, of which \$23,800,000 is the remainder of the \$75,000,000 authorized for the fiscal year 1925 and \$51,200,000 is part of the \$75,000,000 authorized for the fiscal year 1926.

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S. 3074 - INTRODUCED IN THE SENATE ON FEBRUARY 10, 1926, BY T. J. Walsh of Montana.

> PROVIDES THAT THE UNEXPENDED PORTIONS OF THE 1920 AND 1925 MONTANA FEDERAL-AID HIGHWAY APPROPRIA-TIONS SHALL NOT BE REAPPORTIONED AMONG THE BALANCE OF THE STATES AT THE EXPIRATION OF THE TWO YEAR LIMIT BUT THAT THESE FUNDS BE SPENT ON THE CONSTRUCTION OF THE ROAD FROM RED LODGE, MONTANA, THROUGH COOKE CITY TO CONNECT WITH THE EXISTING HIGHWAY LEADING TO YELLOWSTONE NATIONAL PARK.

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H. R. 9504 - INTRODUCED IN THE HOUSE ON FEBRUARY 18, 1926, BY C. C. DOWELL OF JOWA.

> AMENDS THE FEDERAL-AID ROAD ACT OF JULY 11, 1916, AS PREVIOUSLY AMENDED AND SUPPLEMENTED.

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PROVIDES FOR AN AUTHORIZATION OF \$75,000,000 FOR FEDERAL-AID HIGHWAYS AND \$7,500,000 FOR FOREST ROADS AND TRAILS FOR EACH OF THE FISCAL YEARS 1928 AND 1929.

THE BILL WAS ENDORSED BY REPRESENTATIVES OF THE FOLLOWING ORGANIZATIONS WITH DULY AUTHORIZED STATEMENTS:

- 1. AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.
- 2. AMERICAN AUTOMOBILE ASSOCIATION.
- 3. AMERICAN BANKERS ASSOCIATION.
- 4. AMERICAN FARM BUREAU FEDERATION.
- 5. AMERICAN FEDERATION OF LABOR (BY RESOLUTION FILED).
- 6. NATIONAL GRANGE.
- 7. AMERICAN ROAD BUILDERS ASSOCIATION (BY
  - RESOLUTION FILED)
- 8. NATIONAL AUTOMOBILE CHAMBER OF COMMERCE.
- 9. THE CHAMBER OF COMMERCE OF THE UNITED STATES.

## ROAD MATERIALS FROM INDIAN RESERVATIONS MUST BE PURCHASED FOR OUTSIDE USE

## CONTRIBUTED BY THE LEGAL SECTION

THE BUREAU RECENTLY HAD OCCASION TO TAKE UP WITH THE INDIAN OFFICE THE MATTER OF PROCURING MATERIALS FROM AN INDIAN RESERVA-TION FOR USE ON A FEDERAL-AID PROJECT OUTSIDE OF THE RESERVATION. PERMISSION TO SECURE THE MATERIAL WAS SOUGHT BY THE HIGHWAY DEPARTMENT OF ONE OF THE STATES. THE INDIAN OFFICE TOOK THE POSITION THAT MATERIALS COULD NOT BE TAKEN FROM A RESERVATION FOR USE OUTSIDE WITHOUT PAYMENT, BUT THAT SUITABLE MATERIALS AVAILABLE WITHIN A RESERVATION MAY BE USED FREE OF CHARGE IN THE CONSTRUCTION OF A ROAD LOCATED WITHIN THE RESERVATION. THE POSITION OF THE INDIAN OFFICE IS BASED ON THE FACT THAT UNDER THE LAW ITS STATUS IS THAT OF TRUSTEE FOR THE INDIANS, AND THAT SINCE THE INDIAN RESERVATIONS ARE SET ASIDE FOR THE USE AND BENEFIT OF THE INDIANS, THE OFFICE CAN NOT DISPOSE OF ANYTHING OF VALUE DERIVED FROM THEM WITHOUT RECEIVING A REASONABLE RETURN. ON THE OTHER HAND A ROAD BUILT WITHIN AN INDIAN RESERVATION MAY PROPERLY BE REGARDED AS BEING FOR THE USE AND BENEFIT OF THE NDIANS SO THAT MATERIALS FROM WITHIN THE RESERVATION MAY BE USED IN ITS CONSTRUCTION WITHOUT CHARGE .

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## WORKING DRAWINGS AND SPECIFICATIONS OF UNITED STATES HIGHWAYS SIGNS READY

CONTRIBUTED BY THE DIVISION OF DESIGN

WORKING DRAWINGS FOR THE ROUTE MARKERS, DIRECTION AND INFORMATION, AND DANGER AND CRUTION SIGNS ADOPTED FOR USE ON THE UNITED STATES HIGHWAYS ARE EXPECTED TO BE COMPLETED AND IN THE HANDS OF THE STATE HIGHWAY DEPARTMENTS BY APRIL FIRST. THE STANDARD DRAWINGS ARE BEING PREPARED IN THE FORM OF WHITE FRINTS TWENTY-SEVEN INCHES SQUARE ARRANGED IN NUMBERED SERIES. THE M SERIES COVER THE MARKERS IN THE FORM OF UNITED STATES SHIELDS, INCLUDING THE SMALL RIGHT AND LEFT TURN SHIELDS. THE W SERIES INCLUDE THE WARNING SIGNS. THE U SERIES CONSIST OF THE CAUTION SIGNALS. THE A SERIES EMBRACE THE VARIOUS SIZES OF ALPHABETS WHICH WILL BE USED FOR LETTERING THE SIGNS. THE LARGEST LETTERS WILL BE 8 INCHES HIGH AND THE SMALLEST 2 INCHES. LETTERS OF THE SAME HEIGHT WILL BE USED IN DIFFERENT WIDTHS AND THESE WIDTHS WILL BE EXPRESSED BY LETTERS BEGINNING WITH A FOR THE NARROWEST AND INCREASING TO F WHICH IS THE GREATEST WIDTH PLANNED FOR THE PRESENT. IT IS EXPECTED THAT 152 SHEETS WILL COVER THE ENTIRE SERIES NOW PROJECTED.

TENTATIVE SPECIFICATIONS FOR THESE UNIFORM SIGNS AND MARKERS ARE BEING PREPARED AS PROPOSED BY THE JOINT BOARD ON INTERSTATE HIGHWAYS. THESE SPECIFICATIONS CONTEMPLATE THE FABRICATION AND FINISHING OF THE ROAD SIGNS AND MARKERS IN WOOD, EMBOSSED METAL, CAST IRON, CAST STEEL, OR CAST ALUMINUM, AS DESIRED BY THE PURCHASERS. THEY WILL BE USED IN CONNECTION WITH THE STANDARD DRAWINGS PREVIOUSLY REFERRED TO IN CALLING FOR BIDS FROM MANUFACTURERS. THESE SPECI-FICATIONS, WITH THE EXCEPTION OF THOSE FOR THE WOODEN SIGNS AND MARKERS, ARE NOW READY FOR DISTRIBUTION.

LATER ON A MANUAL FOR THE ERECTION OF THE SIGNS AND MARKERS WILL BE PREPARED. THIS WILL EXPLAIN SUCH DETAILS AS THE DEGREE OF CURVATURE UPON WHICH CURVE SIGNS ARE TO BE USED, THE PER CENT OF GRADE AND OTHER CONDITIONS GOVERNING THE NEED FOR A SHIFT-GEAR SIGN AND THE METHOD FOR PLACEMENT OF THE SIGN, PARTICULARLY ITS POSITION WITH RELATION TO THE ROADWAY.

THE BUREAU OF STANDARDS HAS CHECKED THE COLOR VALUE OF A SAMPLE OF YELLOW PAINT AND FIVE GALLONS OF THIS COLOR WILL BE ORDERED. LIQUID SAMPLES IN 1/2-PINT TINS WILL BE DISTRIBUTED TO THE VARIOUS STATE HIGHWAY DEPARTMENTS. A FEW SAMPLES WILL BE AVAILABLE FOR INDUSTRIAL CONCERNS. TWO OR THREE MANUFACTURERS HAVE SIGNIFIED THEIR INTENTION OF MANUFACTURING PAINT OF THIS STANDARD YELLOW COLOR AND HAVE TENTATIVELY SUGGESTED THE NAME "FEDERAL YELLOW."

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U. S. BUREAU OF PUBLIC ROADS 31911



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## PROCEDURE NECESSARY TO SECURE BUREAU EXHIBITS

IN THE PAST THERE SEEMS TO HAVE EXISTED A LACK OF UNDER-STANDING OF THE PROCEDURE NECESSARY TO SECURE BUREAU EXHIBITS. N A NUMBER OF CASES THE INITIAL REQUESTS HAVE BEEN REFERRED TO THE HEADQUARTERS OFFICE AND IN CONSEQUENCE NEGOTIATIONS HAVE BEEN DELAYED. THE SECRETARY HAS DELEGATED THE AUTHORITY TO DISTRIBUTE ALL EXHIBITS OF THE DEPARTMENT TO THE OFFICE OF EXHIBITS WHICH IS DIRECTED BY MR. J. W. HISCOX. THAT OFFICE PREPARES AND PAYS ALL COSTS INCIDENTAL TO THE DISPLAY OF DEPARTMENT EXHIBITS AT WHAT ARE DESIGNATED AS ELIGIBLE FAIRS. THESE INCLUDE STATE OR INTERSTATE AGRICULTURAL FAIRS. ON THE CONTRARY ROAD SHOWS AND SIMILAR CONVENTIONS ARE IN THE NON-ELIGIBLE CLASS AND THERE ARE NEITHER DEPARTMENT NOR BUREAU FUNDS AVAILABLE FOR THE TRANSPOR-TATION, AND DISPLAY CHARGES AT SHOWS OF THIS CHARACTER. IN ORDER TO MAKE EXHIBITS AVAILABLE FOR ROAD CONVENTIONS, THE BUREAU BEARS THE COST OF PREPARATION OF THE MATERIAL. THE CONVENTION MUST FORWARD A CERTIFIED CHECK TO THE OFFICE OF EXHIBITS AT WASHINGTON, D. C., TO COVER THE COST OF TRANSPORTATION, DRAYAGE, LIGHTING, ERECTION, WATCHING AND DISMANTLING BEFORE THE EXHIBIT WILL BE SHIPPED FROM ALEXANDRIA, VIRGINIA.

DISTRICT ENGINEERS MAY EXPEDITE REQUESTS FOR BUREAU EXHIBITS BY REFERRING CORRESPONDENTS DIRECTLY TO THE OFFICE OF EXHIBITS. THE PERSON MAKING THE REQUEST SHOULD STATE SPECIFICIALLY THE NATURE AND PURPOSE OF THE SHOW, THE EXACT DATES AND THE DIMENSIONS AND CHARACTER OF THE SPACE. FOR THE LARGER CONVENTIONS THE BUREAU MAY BE ABLE TO SEND AN EXPERT TO INSTALL, MAINTAIN AND DISMANTLE THE EXHIBIT.

UPON RECEIPT OF A REQUEST IT IS REFERRED BY THE OFFICE OF EXHIBITS TO THIS BUREAU FOR RECOMMENDATION. IF APPROVED, THEY PROCEED WITH THE ARRANGEMENT OF THE DETAILS OUTLINED ABOVE. SINCE REQUESTS MUST BE MADE ULTIMATELY TO THE OFFICE OF EXHIBITS BY THE MANAGER OF A CONVENTION, IT WOULD SAVE TIME IF DISTRICT ENGINEERS WOULD REFER THEM DIRECTLY TO THE OFFICE OF EXHIBITS RATHER THAN TRANSMIT THEM THROUGH THE HEADQUARTERS OFFICE. SIMULTANEOUSLY DISTRICT ENGINEERS SHOULD TRANSMIT THEIR RECOMMENDATIONS TO HEADQUARTERS SO THAT THIS OFFICE WILL BE IN A POSITION TO PASS UPON A REQUEST IMMEDIATELY WHEN REFERRED HERE BY THE OFFICE OF EXHIBITS.

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## BUREAU LIBRARY MOVED TO PROVIDE FOR NECESSARY EXPANSION

THE BUREAU LIBRARY HAS BEEN MOVED FROM THE EIGHTH TO THE FIRST FLOOR IN ORDER TO SECURE SPACE FOR EXPANSION AND IMPROVE THE FACILITIES FOR SERVICE. THERE IS NOW ROOM ON THE SHELVES TO ACCOMMODATE THE EXPECTED ACCESSIONS OF THE IMMEDIATE FUTURE AND PROVISION HAS BEEN MADE FOR FURTHER EXPANSION LATER.

THE LIBRARY IS NOW PROBABLY THE MOST COMPLETE OF ITS KIND IN THE COUNTRY. PRIOR TO 1921 ABOUT 25 BOOKS AND PAMPHLETS WERE ADDED TO THE SHELVES EACH MONTH. SINCE THEN BOOK LISTS AND MAGAZINES CONTAINING REVIEWS OF NEW BOOKS AND REPORTS, HAVE BEEN SCANNED REGULARLY, AND THE AVERAGE MONTHLY ACCESSION OF BOOKS AND PAMPHLETS HAS INCREASED TO 125. IN ADDITION, THE BUREAU ALSO SUBSCRIBES TO 275 MAGAZINES WHICH ARE RECEIVED REGULARLY.

THERE HAS BEEN A CORRESPONDING INCREASE IN THE MONTHLY CIRCULATION FIGURES. THESE HAVE RISEN FROM 75 BOOKS AND 600 MAGAZINES IN 1921 TO THE PRESENT AVERAGE OF 250 BOOKS AND NEARLY 1400 MAGAZINES. THE MAXIMUM FIGURE FOR THE LATTER REACHED 1805 IN ONE MONTH. THE NEW PUBLICATIONS ANNOUNCED IN THE WEEKLY MIME©GRAPHED LISTS ALONE ARE CIRCULATED IN RESPONSE TO AN AVERAGE OF 700 SEPARATE REQUESTS.

THE LIBRARY AS IT IS NOW CONSTITUTED IS NOT MERELY A BOOK REPOSITORY. IT IS AN AGENCY FOR BIBLI-OGRAPHICAL RESEARCH. THE WEEKLY MIMEOGRAPHED LIST BESIDES BRINGING TO THE ATTENTION OF THE WORKERS IN THE BUREAU, ALL IMPORTANT CURRENT HIGHWAY NEWS AND INFORMATION IS ALSO USED AS THE EASIS OF A CONSTANTLY GROWING INDEX BY MEANS OF WHICH IT IS POSSIBLE, ON SHORT NOTICE, TO COM-PILE BIBLIOGRAPHIES ON NEARLY EVERY SUBJECT. THESE FURNISH A WEALTH OF REFERENCES WHEN SUPPLEMENTED BY THE REGULAR LIBRARY CATALOGUE AND THE COMMERCIAL INDEXES FOR WHICH THE BUREAU SUB-SCRIBES REGULARLY.

THE LIBRARY IS IN A POSITION IN THIS WAY TO FURNISH VALUABLE SERVICE TO RESEARCH WORKERS BY PROVIDING ACCESS TO DATA ON PROJECTS WHICH ARE SIMILAR TO THOSE PROPOSED OR IN PROGRESS BY THE BUREAU. A STUDY OF THIS INFORMATION BEFORE A RESEARCH PROJECT IS BEGUN MAY PREVENT A DUPLICATION OF WORK ALREADY ACCOMPLISHED ELSEWHERE.

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set us unitation and us an an exercise and angle of a press of a pre of a press of ANOTHER FUNCTION OF THE LIBRARIANS IS THAT OF READING THE CONGRESSIONAL RECORD AND KEEPING A CARD RECORD OF THE PROGRESS OF LEGISLATION. COPIES OF ALL BILLS, REPORTS, AND IMPORTANT HEARINGS BEARING DIRECTLY OR INDIRECTLY UPON THE INTERESTS OF THE BUREAU ARE KEPT ON FILE AND ARE AVAILABLE AT ALL TIMES.

THE AIM OF THE LIBRARIANS IN THEIR NEW QUARTERS WILL BE TO PROVIDE A MAXIMUM OF SERVICE TO THE WORKERS OF THE BUREAU. THE SERVICE CAN BE MORE EFFECTIVELY RENDERED IF REQUESTS ARE CAREFULLY AND SPEC!FICALLY MADE. THIS WILL ELIMINATE UNNECESSARY WORK AND SO INCREASE THE TOTAL OUTPUT OF THE LIBRARY STAFF. IT IS HOPED THAT THE RULE OF SILENCE WHICH IS THE CUSTON OF ALL LIBRARIES WILL BE OBSERVED BY THOSE WHO USE THE NEW AND MORE COMMODIOUS QUARTERS.

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