# STATE OF NEW JERSEY
# DEPARTMENT OF TRANSPORTATION

FIG. 5

(FIG. 3)

## CONCEPT OF FUTURE ROADWAY NETWORKS

A-WAYS

FIG. 6

B-WAYS

DESIGNED FOR

R=8,000'

## SAFETY AND SERVICE

DIVISION OF

RESEARCH AND EVALUATION

W. R. BELLIS, DIRECTOR

OUR VISION INTO THE FUTURE IS BASED ENTIRELY ON OUR EXPERIENCES OF THE PAST.

THE OLD TIES ARE HARD TO BREAK.

PRECEDENTS ARE SET; LAWS ARE MADE; AND HABITS ESTABLISHED MAKING CHANGES PRACTICALLY IMPOSSIBLE UNTIL CONDITIONS GET SO BAD AS TO SET THE STAGE FOR REVOLUTIONARY CHANGES.

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## DISCLAIMER CLAUSE

THE ROAD NETWORK PROPOSAL INCLUDED IN THIS PAPER IS A CONCEPT OF MR. W. R. BELLIS ONLY AND DOES NOT REFLECT A POLICY OF THE NEW JERSEY DEPARTMENT OF TRANSPORTATION IN ANY WAY.

# 1. SUMMARY BRIEF

## 1.1 RECOMMENDATION

IT IS HEREIN RECOMMENDED THAT A MASTER PLAN EMBODYING AN ENTIRELY NEW CONCEPT WHICH INCLUDES ONE-WAY FREEWAYS FOR ALL CLASSES OF ROADS, INCLUDING HIGH SPEED ROADWAYS AND LAND SERVICE STREETS BE ADOPTED.

## 1.2 BENEFITS

THE BENEFITS ARE DEMONSTRATED TO BE FAR IN EXCESS OF THE COST OF PROVIDING SUCH A SYSTEM. IT IS PROPOSED THAT THIS PLAN BE COMPLETED DURING THE 50-YEAR PERIOD FROM 1975 TO THE YEAR 2025, BY EQUAL YEARLY CONSTRUCTION PROGRAMS. DURING THIS 50-YEAR PERIOD, THERE WOULD BE ALMOST 65 MILLION ACCIDENTS SAVED; ALMOST 200 MILLION INJURIES SAVED; AND ALMOST 1-1/4 MILLION FATALITIES SAVED BY THE ACCRUED REDUCTION IN MOTOR VEHICLE ACCIDENTS. EXPRESSED IN AN EQUIVALENT MONEY VALUE ON TODAY'S MARKET, THIS WOULD BE ALMOST 700 BILLION DOLLARS -- BUT EXPRESSED IN TERMS OF THE AVERAGE YEAR OF THE 50-YEAR PERIOD, IT WOULD AMOUNT TO TWICE THIS VALUE.

## 1.3 COST

IT IS ESTIMATED THAT A CONSTRUCTION PROGRAM OF 700 MILLION DOLLARS PER YEAR (ON TODAY'S MONEY VALUE) FOR 50 YEARS WOULD COMPLETE THE PROGRAM.

## 1.4 FINANCE

IN ORDER TO FINANCE THIS PROGRAM, IT IS PROPOSED TO PAY OFF BONDS FROM A SMALL PART OF THE SAVINGS RESULTING FROM THE REDUCTION IN INSURANCE PREMIUMS. THE ACCUMULATED SAVINGS IN ACCIDENT PREMIUM COSTS FOR THE 50-YEAR PERIOD IS SHOWN TO BE ALMOST 350 BILLION DOLLARS ON TODAY'S MONEY VALUE OR 700 BILLION DOLLARS ON THE MONEY VALUE FOR THE AVERAGE YEAR OF THE 50-YEAR PERIOD. THIS IS IN ADDITION TO THE VALUE OF ACCIDENTS SAVED. THEREFORE, THE BENEFIT COST RATIO IS 60 TO 1, CONSIDERING SAFETY, INSURANCE PREMIUM COSTS AND CONSTRUCTION. IT IS PROPOSED THAT A 10 TO 20 PERCENT LEVY BE IMPOSED UPON THE INSURANCE PREMIUM SAVINGS TO FINANCE THE PROGRAM. THE 80 TO 90 PERCENT OF THE INSURANCE PREMIUM SAVINGS WOULD BE ENJOYED BY THE PUBLIC AS A RESULT OF THE REDUCTION OF ACCIDENT PREMIUMS MADE POSSIBLE.

## 1.5 BY-PRODUCT

A BY-PRODUCT BENEFIT TO THOSE GROUPS IN OUR URBAN AREAS, WHICH ARE CURRENTLY CREATING EXTREME DISTURBANCES BECAUSE OF THEIR DISSATISFACTION AND UNREST, WOULD UNDOUBTEDLY RESULT FROM THIS PLAN. IT MUST BE RECOGNIZED THAT THESE DISTURBANCES EXPERIENCED TODAY SHOW INDICATIONS OF INCREASING IN VIOLENCE AND THAT THIS TYPE OF WORK COULD PROVIDE A LARGE AMOUNT OF EMPLOYMENT FOR THE EXTREMELY UNSKILLED INDIVIDUAL.

# 2. INTRODUCTION

## 2.1 EVOLUTION

TODAY'S ROADWAYS ARE A RESULT OF A GRADUAL EVOLUTION OVER A PERIOD OF THOUSANDS OF YEARS, STARTING WITH FOOTPATHS. LATER, PATHS FOR DOMESTICATED ANIMALS, THEN FOR VEHICLES DRAWN BY HUMANS, BY OX, BY HORSE AND OTHER ANIMALS. THE ROMANS BUILT A VERY GOOD SYSTEM OF ROADS IN EUROPE OVER 2000 YEARS AGO. SECTIONS OF SOME OF THIS SYSTEM ARE STILL IN USE. IN THIS COUNTRY, SOME OF OUR ROADS USED BY HIGH-POWERED MOTOR VEHICLES ARE "HAND-ME-DOWNS" FROM BEFORE THE REVOLUTIONARY WAR, AND MANY OF THESE WERE EXPANSIONS

AND IMPROVEMENTS OF FORMER INDIAN TRAILS. WE MAY STILL BE IN A STAGE OF EVOLUTION. THE FUTURE MAY INCLUDE TRANSPORTATION SYSTEMS NOT IMAGINABLE TODAY. OUR VISION INTO THE FUTURE IS BASED ENTIRELY ON OUR EXPERIENCES OF THE PAST. EACH INNOVATION PUT INTO PRACTICE INCLUDES MUCH OF THE SPECIFICATIONS OF THE PREVIOUS STAGE OF TRANSPORTATION BUT ALSO OPENS UP FIELDS FOR EXPLORATION OF NEW IDEAS. THE FACT THAT ANY FORWARD STEP BEARS THE VIVID MARKS OF THE PREVIOUS STAGE MAKES IT VERY DIFFICULT TO PROGRESS INTO ANOTHER STAGE WHICH IS NOW OBVIOUSLY NEEDED. THE OLD TIES ARE HARD TO BREAK. PRECEDENTS ARE SET; LAWS ARE MADE; AND HABITS ESTABLISHED MAKING CHANGES PRACTICALLY IMPOSSIBLE UNTIL CONDITIONS GET SO BAD AS TO SET THE STAGE FOR REVOLUTIONARY CHANGES.

WHEN WE DO EMBARK INTO A NEW STAGE, WE TAKE THE ATTITUDE THAT THIS IS THE ULTIMATE AND COMMIT OURSELVES TO THIS FACT. ONLY A FEW INDIVIDUALS CONTINUE TO PROJECT INTO THE FUTURE AND VISUALIZE THAT FURTHER CHANGES WILL BE NECESSARY. MOST PROGRESSIVE STEPS FORWARD ARE VIEWED AS BEING FANTASTIC OR HIGHLY IMPRACTICAL UNTIL THE OLD METHOD IS PROVEN TO BE NONWORKABLE. TODAY'S HIGHWAY DESIGN WOULD HAVE BEEN CONSIDERED HIGHLY IMPRACTICAL BY OUR GRANDPARENTS 50 YEARS AGO, BUT TODAY THESE DESIGNS ARE ACCEPTED AS ROUTINE PRACTICES. THE SAME STATEMENT WILL BE MADE BY OUR GRANDCHILDREN 50 YEARS FROM NOW. EACH PROGRESSIVE STAGE OF IMPROVEMENT HAS DIFFERENT SOLUTIONS TO DIFFICULT PROBLEMS. THEY DO NOT REPLACE OLD IDEAS; THE OLD PRINCIPLES ARE STILL IN EXISTENCE AND ARE STILL BEING USED.

THERE ARE MANY VARIATIONS OF EACH TYPE OF HIGHWAY DESIGN. OUR ROAD NETWORK INCLUDES, ON THE ONE EXTREME, CITY STREETS WHICH WERE IN EXISTENCE LONG BEFORE THE MOTOR VEHICLE CAME INTO BEING, AND THESE STREETS STILL SERVE, AS THEIR PRIMARY FUNCTIONS, PEDESTRIANS. ON THE OTHER HAND, WE HAVE THE FREEWAY WHICH HAS RECENTLY BECOME POPULAR AND HAS THE PRIMARY FUNCTION OF SERVING HIGH-SPEED PASSENGER CARS AND TRUCKS. IN SOME CASES, CITY STREETS ARE DESIGNATED AS THROUGH ROADS AS AN ATTEMPT TO SERVE THE MOTOR VEHICLES BUT THERE THEN EXISTS A SERIOUS CONFLICT BETWEEN THE PEDESTRIAN ACTIVITIES AND THE MOTOR VEHICLE.

THE PRIMARY REASON FOR SEEKING A DIFFERENT TYPE OF ROADWAY DESIGN IS TO INCREASE THE LEVEL OF SERVICE FOR THE HIGHWAY USER WHEN IT BECOMES APPARENT THAT THE OLD TYPE IS OUTGROWN. EACH NEW DEVELOPMENT GOES THROUGH A PERIOD OF POPULARITY, SUCH AS A "FAD", THEN LATER ON IT BECOMES ROUTINE AND, STILL LATER, OLD-FASHIONED.

MANY OF THE VERY BEST IDEAS WERE DIFFICULT TO SELL TO THE PUBLIC IN THE ORIGINAL CONCEPT. THEY GO THROUGH A PERIOD WHERE IT IS ASSUMED THEY ARE THE SOLUTION TO ALL THE EXISTING PROBLEMS. EXAMPLES OF THIS ARE PAVED ROADS COMPARED TO UNPAVED ROADS, TRAFFIC SIGNALIZED INTERSECTIONS COMPARED TO NON-SIGNALIZED INTERSECTIONS, DIVIDED HIGHWAYS, TRAFFIC CIRCLES, ONE-WAY STREETS, CLOVERLEAFS, CHANNELIZATION, DIRECTIONAL INTERCHANGES, JUGHANDLES, LEFT TURN CHANNELS, DIAMOND INTERCHANGES, AND FREEWAYS.

THE EXPLORATION FOR NEW SOLUTIONS CONTINUES. SOME ARE IN THE DIRECTION OF MASS TRANSPORTATION, SOME IN THE DIRECTION OF ELECTRONIC CONTROL OF VEHICLES. THE BEST AND GREATEST UTILIZATION OF EACH TRANSPORTATION MODE WILL BE REQUIRED IN THE FUTURE.

WHEN WE LOOK INTO THE PAST, WE SEE THAT EACH SUCCESSIVE TRANSPORTATION SYSTEM PROGRESSED WITH GRADUAL IMPROVEMENT UNTIL IT WAS OUTGROWN AND OUTMODED BY THE INCREASE OF POPULATION AND THE NEEDS OF THIS POPULATION. AT THIS TIME, NEW MODES OF TRAVEL ARE SOUGHT. UNTIL A BREAKTHROUGH IS DEVELOPED, THE PEOPLE MUST TOLERATE UNDESIRABLE CONDITIONS OR BE SATISFIED THAT ADDITIONAL PROGRESSIVE IMPROVEMENTS ARE IMPOSSIBLE. IN THIS CASE, THE SOCIETY BECOMES DECADENT.

## 2.2 PROGRESS

AT FIRST, MAN MOVED AROUND ON FOOT. LATER HE WAS ABLE TO DOMESTICATE CERTAIN ANIMALS AND USE THEM AS BEASTS OF BURDEN. EXAMPLES ARE THE HORSE, THE MULE, THE CAMEL, THE ELEPHANT, AND THE DOG. THIS ELEVATED MAN'S SOCIAL STATUS GREATLY AND THOSE SOCIETIES WHICH USED ADVANCED METHODS OF TRANSPORTATION TO THE GREATEST EXTENT WERE THE MOST PROSPEROUS AND ENJOYED LIFE MUCH MORE THAN OTHERS.

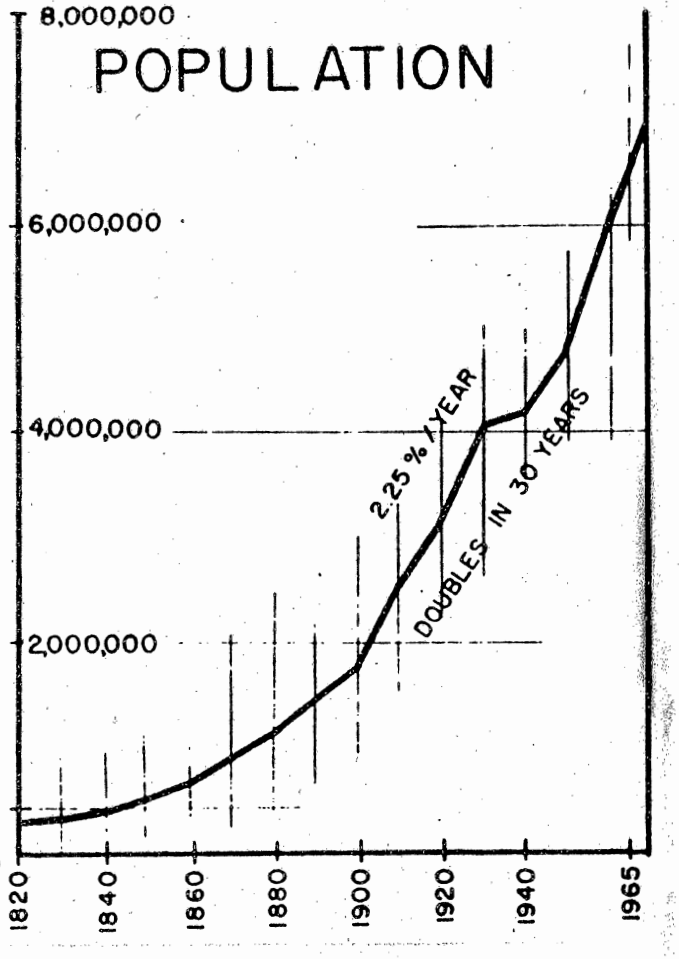
WHEN THE WHEEL WAS DEVELOPED, THIS MADE POSSIBLE THE USE OF CARRIAGES OR WAGONS DRAWN BY THESE BEASTS OF BURDEN. THIS, THEN, WAS A FURTHER ADVANCE IN SOCIETY AND PROVIDED A STILL GREATER ENJOYMENT OF LIFE. PEOPLE WERE SATISFIED WITH THIS MEANS OF TRANSPORTATION FOR MANY YEARS AS IS TRUE OF EACH STAGE OF ADVANCEMENT.

THE BICYCLE CAME INTO BEING TO PROVIDE A STILL FURTHER ADVANCE IN OUR WAY OF LIVING. THE CANAL BOAT AND RIVER BOAT CAME INTO GREAT USE FOR TRANSPORTATION ACROSS LARGE LAND AREAS. EACH OF THESE, DURING ITS PERIOD OF POPULARITY, WAS PROBABLY CONSIDERED TO HAVE DISPLACED OTHERS BEFORE IT AS THE MAJOR MEANS OF TRANSPORTATION. BUT, IT IS POSSIBLE THAT MANY OF THE OUTMODED SYSTEMS ARE USED TODAY MORE THAN THEY WERE IN THEIR HEYDAY IN ACTUAL MILES OF USE BUT NOT PERCENTAGE-WISE. THEN, IN WHAT WE LIKE TO CALL THE "MODERN PERIOD", CAME THE TRAIN, TROLLEY CAR, THE AUTOMOBILE, AND THE AIRPLANE.

## 2.3 DESIRES

REASONS FOR CHANGE WERE THE DESIRES TO TRAVEL LONGER DISTANCES IN LESS TIME WITH GREATER COMFORT AND CONVENIENCE. THE POSSIBILITIES OF EACH STAGE WERE DEVELOPED AND EXPLORED TO THE PROBABLE MAXIMUM UTILIZATION. EACH WAS NOT SUFFICIENT IN ITSELF. IT REQUIRED OTHER MODIFICATIONS TO OUR WAY OF LIFE, SUCH AS, THE ORIGINAL TRAILS OR FOOTPATHS HAD TO BE WIDENED TO PROVIDE FOR THE ADDITIONAL WIDTH OF THE BEAST OF BURDEN, THEN STILL WIDER FOR THE CARRIAGE, THEN HARDER PAVEMENTS FOR THE BICYCLE, CANALS FOR THE CANAL BOATS, RAILS FOR THE TRAIN AND TROLLEY, ROADWAYS FOR THE AUTOMOBILE, AND AIRPORTS FOR THE AIRPLANE. EACH REQUIRED VASTLY INCREASED EXPENDITURES OF EFFORT, ENERGY AND MONEY.

STILL DEVELOPING ARE THE AUTOMOBILE AND THE AIRPLANE. THE NEED FOR FURTHER CONTINUED DEVELOPMENT TO INCREASE CAPACITY AND SERVICE FOR TRANSPORTATION OF PEOPLE AND GOODS WITHIN THE LIMITS OF OUR ABILITY IS RECOGNIZED. THIS NEED IS PRESSURED BY THE CONTINUED GROWTH OF POPULATION PROJECTED INTO THE FUTURE AND THE DESIRE FOR THE CONTINUED IMPROVEMENT IN OUR LIVING STANDARDS. THE TRAIN, WHICH HAS SHOWN SIGNS OF DECAY, MAY HAVE A REVIVAL TO HELP COPE WITH FUTURE TRANSPORTATION NEEDS.



## 3. THE PROBLEM

### 3.1 GROWTH

DURING THE PERIOD OF 1917 AND 1918 (50 YEARS AGO), TRAFFIC COUNTS WERE MADE AT 55 LOCATIONS IN NEW JERSEY. THE VOLUMES OF TRAFFIC RANGED FROM 90 TO 7800 PER DAY. THE 7800 WAS IN JULY AT ASBURY PARK, A SEASIDE RESORT. THESE LOCATIONS WERE UNDOUBTEDLY CONSIDERED HIGH VOLUME LOCATIONS FOR THAT TIME. /1

ASSUMING THAT 2-LANE UNDIVIDED ROADS WERE AVAILABLE, THE VOLUMES COULD INCREASE MANYFOLD BEFORE OVER-CAPACITY VOLUMES REQUIRED WIDENING OF THE ROAD. FOR INSTANCE, A ROAD CARRYING 500 CARS A DAY COULD CARRY 10 TO 15 TIMES AS MUCH TRAFFIC BEFORE WIDENING WAS NECESSARY. WITH NORMAL GROWTH, IT WOULD TAKE 50 YEARS FOR A ROAD WITH 500 AN AVERAGE DAY TO JUSTIFY WIDENING. SOME OF THE LOCATIONS COUNTED IN 1917 ARE STILL 2-LANE ROADS BUT, IN OTHER LOCATIONS, TRAFFIC GREW MUCH FASTER AND EVEN 8 LANES ARE NOT ENOUGH.

EACH OF THESE HAVE GIVEN GOOD SERVICE WITHIN LIMITS, BUT, AS THE TRAFFIC VOLUME INCREASES, THE CAPACITY OF EACH HAS BEEN EXCEEDED RESULTING IN SLOWING DOWN OF VEHICLES AND IRRITATING DEGREES OF CONGESTION. SOLUTIONS ARE NOW BEING SOUGHT JUST AS THEY WERE SOUGHT IN YEARS GONE BY.

EVEN WITH OUR FREEWAYS, GRADE SEPARATIONS, ETC., IN SOME AREAS AND DURING CERTAIN HOURS, THE FLOW OF TRAFFIC IS NO BETTER THAN IT WAS WITHOUT THE SO-CALLED MODERN IMPROVEMENTS. THE FACILITY, IN ORDER TO LAST, MUST BE FLEXIBLE ENOUGH SO THAT ITS CAPACITY CAN BE READILY INCREASED TO KEEP PACE WITH THE GROWING TRAFFIC VOLUMES.

### 3.2 LIMITS

THE FREEWAY HAS THE GREATEST CAPACITY BUT THIS IS ALSO LIMITED. THE CAPACITY OF ONE LANE IS SLIGHTLY OVER 2,000 CARS PER HOUR; 2,413 PER HOUR WAS RECORDED IN ONE INSTANCE, AND 2,200 IS QUITE COMMON. IT IS HIGHLY IMPROBABLE THAT THIS WILL BE SIGNIFICANTLY INCREASED. ELECTRONIC CONTROL OF VEHICLES IS BEING CONSIDERED BY MANY AS BEING POSSIBLE BUT AS YET IS NOT ASSUMED TO BE PRACTICAL.

THE ROADS WE ARE BUILDING TODAY ARE MUCH MORE EXPENSIVE THAN THOSE BUILT PREVIOUSLY. SOME ARE COSTING $10 MILLION A MILE COMPARED TO $25 THOUSAND PER MILE IN THE EARLY 1920's. SOME $25 THOUSAND A MILE ROADS DID NOT REACH OVER-CAPACITY CONDITIONS FOR 40 YEARS BUT SOME OF THE $10 MILLION A MILE ROADS REACH OVER-CAPACITY CONDITIONS IN ONE YEAR. UNLESS THESE ROADS CAN BE MADE FLEXIBLE FOR THE FUTURE, MUCH OF THIS INVESTMENT WILL BE LOST AND THEIR PURPOSE AS PRINCIPAL ROUTES WILL BE ABANDONED, BECOMING NO MORE THAN MINOR SERVICE ROADS.

WITH THE CAPACITY OF A FREEWAY LIMITED BY THE CAPACITY PER LANE, THE ONLY WAY OF INCREASING THE CAPACITY OF A FREEWAY IS TO ADD LANES. OUR PRESENT DAY FREEWAYS UTILIZE MANY BRIDGES, MANY OF WHICH ARE PRACTICALLY IMPOSSIBLE TO WIDEN. IN THIS DISCUSSION WHEN THE TERM "BRIDGE" IS USED, IT INCLUDES UNDERPASSES AS WELL AS OVERPASSES.

ONE FREEWAY IN CALIFORNIA HAS EXPERIENCED A VOLUME OF 260,000 PER AVERAGE DAY. THERE ARE QUITE A FEW FREEWAYS WITH OVER 150,000 AN AVERAGE DAY, AND INCREASES ON MOST OF THESE ARE LIMITED BY CAPACITY OR OTHERWISE THEIR VOLUMES WOULD STILL BE HIGHER.

A ROAD WITH 300,000 CARS AN AVERAGE DAY IS NOT OUTSIDE THE REALM OF PROBABILITY AND SUCH A ROAD COULD POSSIBLY HAVE AN INCREASE OF 10 PERCENT ONE YEAR OVER THE PREVIOUS YEAR IF THERE WAS NO CAPACITY LIMITATION. IN SUCH A CASE, WITH A DESIGN HOUR FACTOR OF 10 PERCENT, THE DESIGN HOUR VOLUME INCREASE WOULD BE 1500 CARS PER HOUR ONE WAY. ACCEPTED DESIGN PRACTICES, THEREFORE, WOULD REQUIRE THE ADDITION OF ONE LANE IN EACH DIRECTION EACH YEAR. AS VOLUMES CONTINUED INCREASING, ADDED LANES SHOULD BE NEEDED MORE OFTEN.

/1 Pages 6, 7

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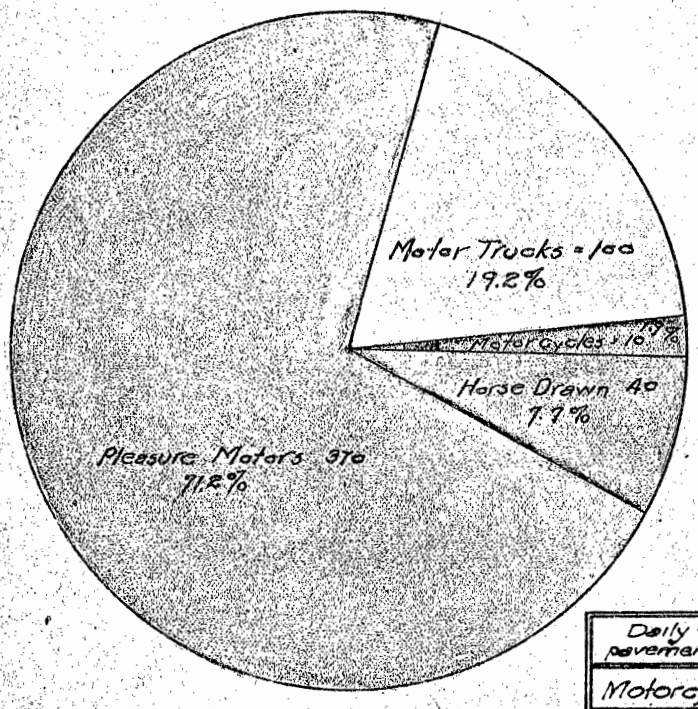
# CHART

SHOWING PERCENTAGES BY VOLUME & NUMBER OF VEHICULAR TRAFFIC ON ROADS THROUGHOUT THE STATE.

## N.J. STATE HIGHWAY DEPARTMENT.

ROAD Somerville - Bound Brook on Union Ave.
COUNTY Somerset
POINT OF OBSERVATION From Jct. of Union & Gaston Aves to Bound Brook
DATE Nov. 6 & 7 - 1917 HOURS OF OBSERVATION - FROM 6 A.M. TO 10 P.M.
WIDTH OF PAVEMENT. 24' Number of days observed. 10

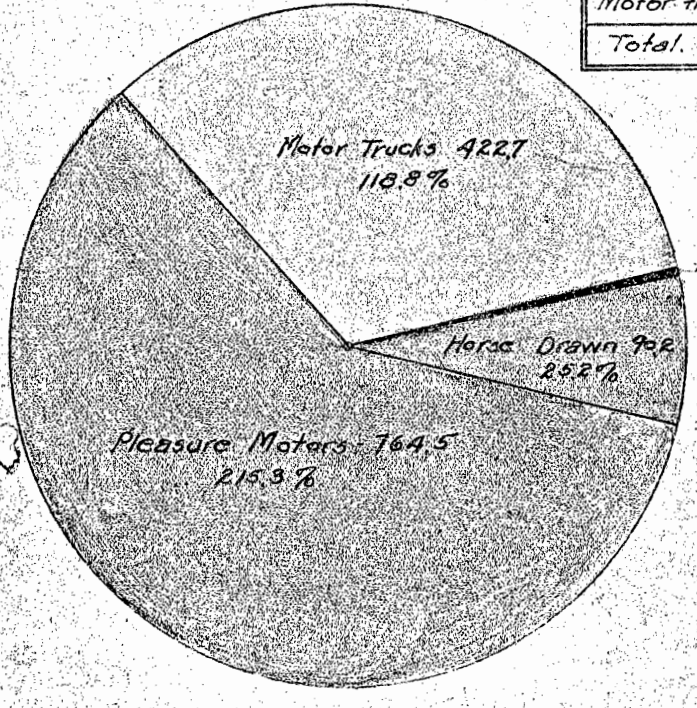
Average number of vehicles per day. 520




DISTRIBUTION

| Daily tonnage per ft. width of pavement, not including Sundays. | |
|---|---|
| Motorcycles | |
| Horse drawn vehicles. | |
| Pleasure motors. | |
| Motor trucks. | |
| Total. | |

Average tonnage per day 1279.7 Tons.




DISTRIBUTION.



Somerville

# TRAFFIC CENSUS SHEET

Count No. 2 Station No. Middlebury County

STATE HIGHWAY DEPARTMENT OF NEW JERSEY Sec 9 B 191 9

Albany Ave ROAD AT New Brunswick Ave

EXACT LOCATION Near Albany Ave. & George St.

COUNT TAKEN Dec 9th FROM 2 PM TO 10 PM FROM TO

| TIME COUNT WAS TAKEN | Motorcycles | Light Horse | | | Heavy Horse | | | Pleasure Motor Cars | | Light Motor Trucks | | | Heavy Motor Trucks | | | Specials | | | Street Cars | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Empty | Half Loaded | Loaded | Empty | Half Loaded | Loaded | Light | Heavy | Empty | Half Loaded | Loaded | Empty | Half Loaded | Loaded | 10-Tons | 15-Tons | Over 15-Tons | | |
| 6 A.M. to 7 A.M. | | | | | | | | | | | | | | | | | | | | |
| 7 A.M. to 8 A.M. | | | | | | | | | | | | | | | | | | | | |
| 8 A.M. to 9 A.M. | | | | | | | | | | | | | | | | | | | | |
| 9 A.M. to 10 A.M. | | | | | | | | | | | | | | | | | | | | |
| 10 A.M. to 11 A.M. | | | | | | | | | | | | | | | | | | | | |
| 11 A.M. to 12 N. | | | | | | | | | | | | | | | | | | | | |
| 12 N. to 1 P.M. | | | | | | | | | | | | | | | | | | | | |
| 1 P.M. to 2 P.M. | | | | | | | | | | | | | | | | | | | | |
| 2 P.M. to 3 P.M. | | 9 | | 4 | 3 | | 2 | 88 | 121 | 74 | | 30 | 10 | | 8 | | | | | 349 |
| 3 P.M. to 4 P.M. | | V | | 2 | V | | 4 | 100 | 136 | V | | 33 | 12 | | 6 | | | | | V8 |
| 4 P.M. to 5 P.M. | 1 | 6 | | 2 | 6 | | 3 | 98 | 125 | V0 | | 2V | 7 | | 10 | | | | | 333 |
| 5 P.M. to 6 P.M. | 2 | 7 | | 2 | 2 | | 2 | 120 | 171 | 48 | | 3V | 6 | | 8 | | | | | 403 |
| 6 P.M. to 7 P.M. | 2 | V | | 1 | 2 | | 1 | 9V | 106 | 40 | | 22 | V | | 6 | | | | | 2V |
| 7 P.M. to 8 P.M. | | 3 | | | | | | V1 | 78 | 21 | | 16 | 1 | | 4 | | | | | 174 |
| 8 P.M. to 9 P.M. | | 2 | | | | | | 48 | 8V | 20 | | 16 | 2 | | V | | | | | 178 |
| 9 P.M. to 10 P.M. | | | | | 1 | | | 40 | VV | 1V | | 12 | 3 | | V | | | | | 131 |
| 10 P.M. to 11 P.M. | | | | | | | | | | | | | | | | | | | | |
| 11 P.M. to 12 M. | | | | | | | | | | | | | | | | | | | | |
| 12 M. to 1 A.M. | | | | | | | | | | | | | | | | | | | | |
| 1 A.M. to 2 A.M. | | | | | | | | | | | | | | | | | | | | |
| 2 A.M. to 3 A.M. | | | | | | | | | | | | | | | | | | | | |
| 3 A.M. to 4 A.M. | | | | | | | | | | | | | | | | | | | | |
| 4 A.M. to 5 A.M. | | | | | | | | | | | | | | | | | | | | |
| 5 A.M. to 6 A.M. | V | 37 | | 11 | 19 | | 12 | 640 | 877 | 323 | | 189 | 46 | | V2 | | | | | 2211 |

TOTAL ROADWAY—

Of the above motor vehicles 17 carried foreign licenses as follows: Penn 6

Weather Fair

Type of pavement Brick Condition of pavement Poor

Width of roadway 40 ft. Width of pavement 40 ft. Traffic Narrow Tires Level

Specials Inspector Hansen

Notes Checked by

SPACE BELOW THIS LINE RESERVED FOR OFFICE USE

| Kind of Vehicle | No. of Vehicles | Weight, Tons |
|---|---|---|
| Motorcycles | V | 0.25 |
| Light Horse, Empty | 37 | 1.25 |
| Light Horse, Half Loaded | | 1.60 |
| Light Horse, Loaded | 11 | 2.00 |
| Heavy 2-Horse, Empty | 19 | 3.20 |
| Heavy 2-Horse, Half Loaded | | 4.70 |
| Heavy 2-Horse, Loaded | 12 | 6.20 |
| Light Pleasure Motor | 640 | 1.50 |
| Heavy Pleasure Motor | 877 | 2.50 |
| Light Motor Truck, Empty | 323 | 1.00 |
| Light Motor Truck, Half Loaded | | 1.75 |
| Light Motor Truck, Loaded | 189 | 2.50 |
| Heavy Motor Truck, Empty | 46 | 5.00 |
| Heavy Motor Truck, Half Loaded | | 8.00 |
| Heavy Motor Truck, Loaded | V2 | 10.50 |
| Specials | | |
| Specials, 10-Tons | | |
| Specials, 15-Tons | | |
| Specials, Over 15-Tons | | |
| TOTALS | 2211 | |

Filed Sheet No. County

Tonnage per ft. width of pavement

Tonnage per ft. width of roadway

Includes weight of horses.

Motorcycles Tons

Light Horse, Empty Tons

Light Horse, Half Loaded Tons

Light Horse, Loaded Tons

Heavy Horse, Empty Tons

Heavy Horse, Half Loaded Tons

Heavy Horse, Loaded Tons

Light Pleasure Tons

Heavy Pleasure Tons

Light Motor Truck, Empty Tons

Light Motor Truck, Half Loaded Tons

Light Motor Truck, Loaded Tons

Heavy Motor Truck, Empty Tons

Heavy Motor Truck, Half Loaded Tons

Heavy Motor Truck, Loaded Tons

Calculations by GMacK Filed by Date Filed

WITH AN INCREASE OF 10 PERCENT PER YEAR EACH YEAR, THE TRAFFIC VOLUME WOULD BE DOUBLED IN 7-1/2 YEARS. THE NUMBER OF LANES, THEREFORE, SHOULD ALSO BE DOUBLED. ON THIS BASIS, IT IS EASY TO REALIZE THE IMPRACTICABILITY OF WIDENING OUR CURRENT FREEWAY BRIDGES.

## 3.3 DESIGN POLICY

IN THE PERIOD 1917 TO 1920, THERE WERE A COUPLE OF ROADS WITH AS MANY AS 2,000 CARS AN AVERAGE DAY. THESE COULD GROW FOR 30 YEARS BEFORE JUSTIFYING WIDENING. DURING THAT PERIOD, POLICIES OF DESIGNING NEW ROADS FOR 20 OR 30 YEARS HENCE SEEMED QUITE LIBERAL. THE NEW JERSEY STATE HIGHWAY DEPARTMENT WAS CREATED IN 1917 AND THE HIGHWAY RESEARCH BOARD IN 1919. MUCH OF OUR BASIC DESIGN POLICIES OF TODAY ORIGINATED BACK IN THIS PERIOD, WHEN THE AVERAGE DAY VOLUME WAS ABOUT 500 CARS. IN 1937, THE AVERAGE STATE HIGHWAY HAD 4,400 CARS AN AVERAGE DAY, AND IN 1967, THE AVERAGE SECTION OF STATE HIGHWAY HAD 16,000 CARS AN AVERAGE DAY.

SOME LOCATIONS IN 1967 WERE WELL OVER 100,000 CARS A DAY AND VOLUMES ARE STILL GROWING AT THE SAME RATE THAT THEY WERE BEFORE. THE GEORGE WASHINGTON BRIDGE HAD 175,000. ROUTE U.S. 1 AT NEWARK AIRPORT HAD 116,000. THE GARDEN STATE PARKWAY SOUTH OF ROUTE 22 HAD 113,000 -- AND ROUTE U.S. 46 AT GREAT NOTCH HAD 107,000. WE ARE NOT BUILDING ROADS FOR THE PAST OR FOR THE PRESENT; IN FACT, THE PRESENT IS ALREADY PAST. WE MUST BUILD ROADS FOR THE FUTURE. THERE STILL IS A FUTURE AND WE MUST RECOGNIZE THIS FACT. TODAY WAS YESTERDAY TOMORROW.

WE SAY WE ARE DESIGNING FOR 20 YEARS HENCE. IN HIGH VOLUME LOCATIONS THIS IS NOT TRUE. TRAFFIC IS GROWING FASTER THAN ROADS ARE BUILT SO THAT, BY THE TIME THE ROAD IS FINISHED, THE TRAFFIC VOLUME EXCEEDS THE CAPACITY OF THAT ROAD. OUR DESIGN POLICIES ARE BASED ON PAST EXPERIENCE AND DO NOT SATISFACTORILY APPLY FOR THE FUTURE. THE GROWTH RATE IS NO DIFFERENT THAN IT EVER WAS. THE VOLUMES ARE GREATER AND IT IS THE VOLUME FOR WHICH WE MUST DESIGN.

WE LOOK BACK AT THE PAST, YES, WE LOOK BACK FOR TWO THOUSAND YEARS. THERE ARE SOME ROADS THAT ARE A THOUSAND YEARS OLD AND, SOME OF THE ROADS WE HAVE TODAY MAY BE IN USE FOR MORE THAN A THOUSAND YEARS. OUR PRESENT DAY DESIGN POLICIES DO NOT PROVIDE FLEXIBILITY WHICH CAN KEEP PACE WITH THE GROWING TRAFFIC VOLUME. OUR ROADS SHOULD BE DESIGNED SO THAT THEY CAN BE WIDENED IN THE FUTURE, TWENTY YEARS FROM NOW, FIFTY YEARS FROM NOW, A HUNDRED YEARS FROM NOW AND POSSIBLY MORE. THIS IS NOT TO SAY THAT THE PRESENT GENERATION SHOULD PAY FOR THESE LONG RANGE FUTURE DESIGNS, BUT THEY SHOULD MAKE THIS WIDENING POSSIBLE WITHOUT UNREASONABLE COSTS TODAY OR IN THE FUTURE.

THERE ARE MANY ARGUMENTS AGAINST PROVIDING FOR THE FUTURE. ONE STRONG ARGUMENT IS, WHY SHOULD WE TODAY PAY FOR EXPENSIVE ROADS THAT WILL BE USED BY PEOPLE IN THE FUTURE? THEN, WHEN BOND FINANCING IS PROPOSED, THE ARGUMENT IS USED, WHY SHOULD WE SADDLE OUR CHILDREN AND OUR GRANDCHILDREN WITH OUR DEBTS? BOND FINANCING IS RESISTED BECAUSE OF THE INTEREST CHARGES. THE LONGER THE LIFE OF THE BONDS, THE GREATER THE OBJECTION. A MILLION DOLLARS WORTH OF HIGHWAY CONSTRUCTION TODAY WOULD COST TWO MILLION DOLLARS IF DONE FIFTEEN TO TWENTY YEARS FROM NOW. IF INTEREST RATES ON BONDS ARE 4 PERCENT AND THE ECONOMY OF THE COUNTRY IS INCREASING ALSO AT 4 PERCENT, THERE IS NO LOSS OR GAIN IN THIS FINANCING. IF THE ECONOMY IS GROWING AT A FASTER RATE THAN INTEREST CHARGES, THEN IT IS VERY PROFITABLE TO ISSUE BONDS TO PAY FOR CONSTRUCTION. IT IS VERY POSSIBLE THAT DURING THE NEXT YEAR OUR ECONOMY, INCLUDING ANY INFLATION, MAY INCREASE 8 PERCENT.

ANOTHER DETERRENT TO PROGRESSIVE POLICIES IS THAT WE, AS INDIVIDUALS, WANT TO SEE ACCOMPLISHMENTS DURING SHORT PERIODS OF TIME. AN AMBITIOUS INDIVIDUAL LIKES TO SHOW ACCOMPLISHMENTS EACH YEAR. IN SO DOING, HE MAY THEN DEMAND INCREASED

SALARIES AND RESPONSIBILITIES. THE PROGRESS HE SHOWS IN A SHORT PERIOD OF TIME MAY LEAD TO HIS CHANGE OF EMPLOYMENT FOR HIS FINANCIAL BETTERMENT. THOSE IN ELECTED OFFICE DESIRE TO SHOW PROGRESS INITIATED BY THEM AND ACCOMPLISHED DURING THEIR TERM OF OFFICE. THEY MAY VERY OFTEN BE DISINTERESTED IN THE CONTINUATION OF PROJECTS INITIATED BY PREDECESSORS, ESPECIALLY IF THEY ARE FROM THE OPPOSITE POLITICAL PARTY. NEITHER ARE THEY INTERESTED IN INITIATING A WORTHWHILE PROJECT WHICH WOULD BE COMPLETED BY A SUCCESSOR, ESPECIALLY FROM THE OTHER POLITICAL PARTY WHO WOULD THEN BE REWARDED FOR SOMEONE ELSE'S EFFORTS.

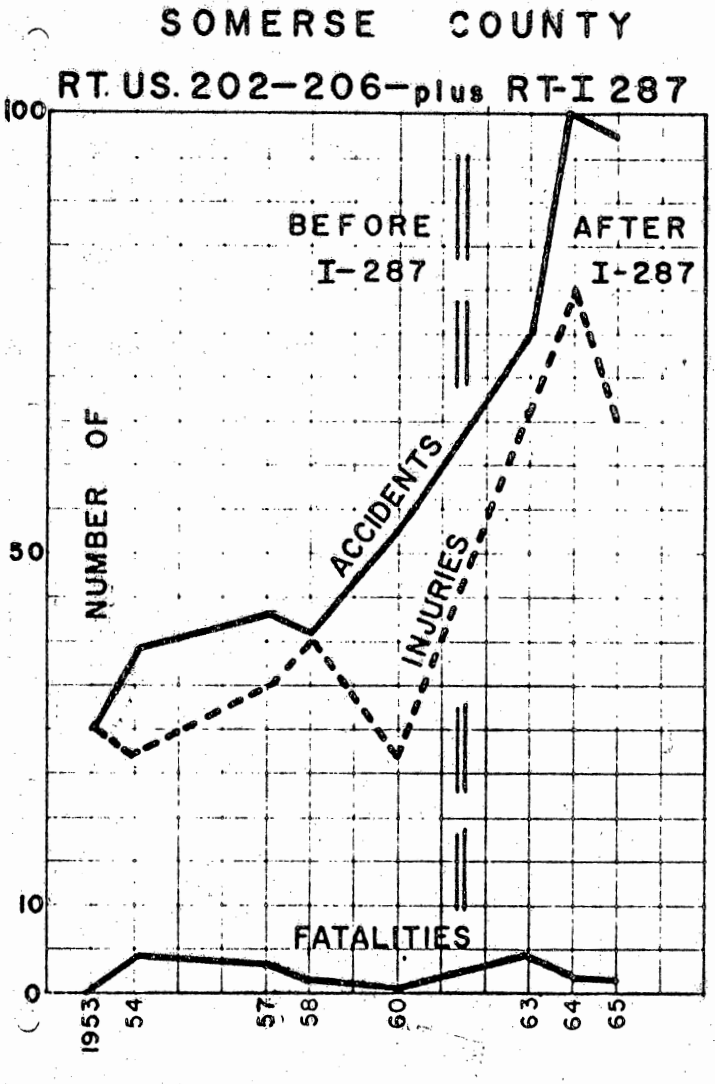
THE CURRENT SYSTEM OF FREEWAYS BEING BUILT WAS JUSTIFIED ON THE BASIS OF SAFETY. /1 /2

THE OVERALL AVERAGE OF 3.09 DOES NOT INDICATE THAT THE INTERSTATE FREEWAYS ARE AS SAFE AS ADVERTISED. THIS CAN BE COMPARED WITH THE RATE OF 3.3 FOR ALL NEW JERSEY DIVIDED STATE HIGHWAYS IN 1965. THE FATALITY RATES FOR THE INTERSTATE FREEWAYS RANGE FROM 1.00 IN DELAWARE AND 1.63 IN NEW HAMPSHIRE TO 6.95 IN LOUISIANA AND 7.56 IN WYOMING. THIS IS NOT A RECORD TO BE PROUD OF. I AM SURE WE CAN FIND AS MANY NON-FREEWAY TYPE STATE HIGHWAYS IN NEW JERSEY HAVING RATES OF 1.00 AND 1.63 AS THERE ARE INTERSTATE FREEWAYS IN DELAWARE AND NEW HAMPSHIRE. IT DOES NOT APPEAR THAT SAFETY HAS BEEN DESIGNED INTO THESE FREEWAYS. THE RATES SEEM TO HAVE AS MUCH RANDOM SCATTER AS DO THE NON-FREEWAYS IN NEW JERSEY.

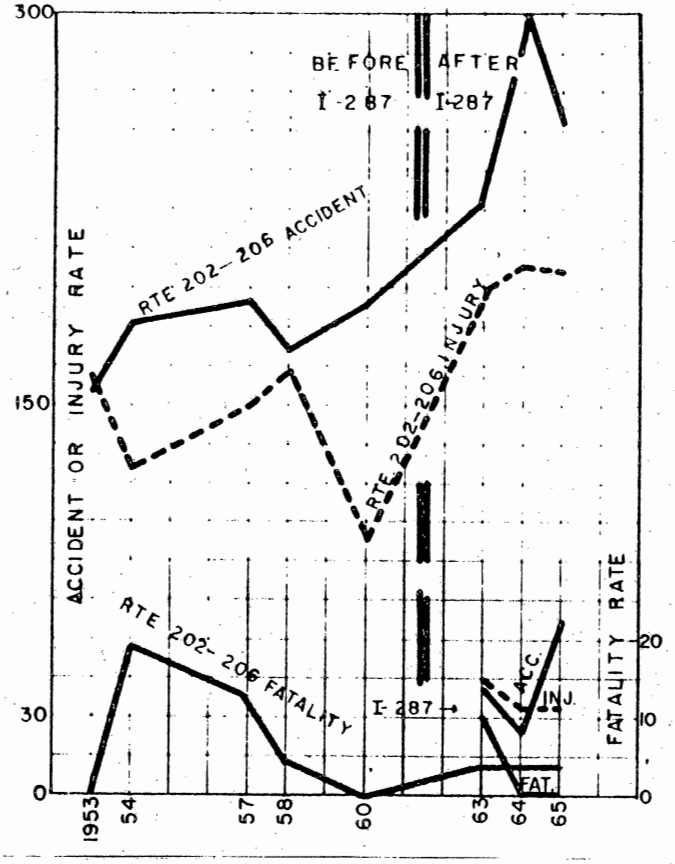
THE FATALITY RATES FOR THE TOLL ROADS IN 1966 VARIED UP TO 12.2 WITH AN AVERAGE OF 2.8 FOR ALL TOLL ROADS IN THE COUNTRY. IN DISCUSSIONS, USING FREEWAYS AS EXAMPLES OF GOOD DESIGN, WE ARE PRONE TO SELECT ONLY THOSE SECTIONS WHICH HAVE SAFE RECORDS. EITHER WE DO NOT KNOW HOW TO DESIGN SAFE ROADS AND SOME PROVE TO BE SAFE BY CHANCE, OR WE DO KNOW HOW BUT ARE SINCERE ONLY ON CERTAIN SECTIONS.

/1 Page 11
/2 Pages 12-14

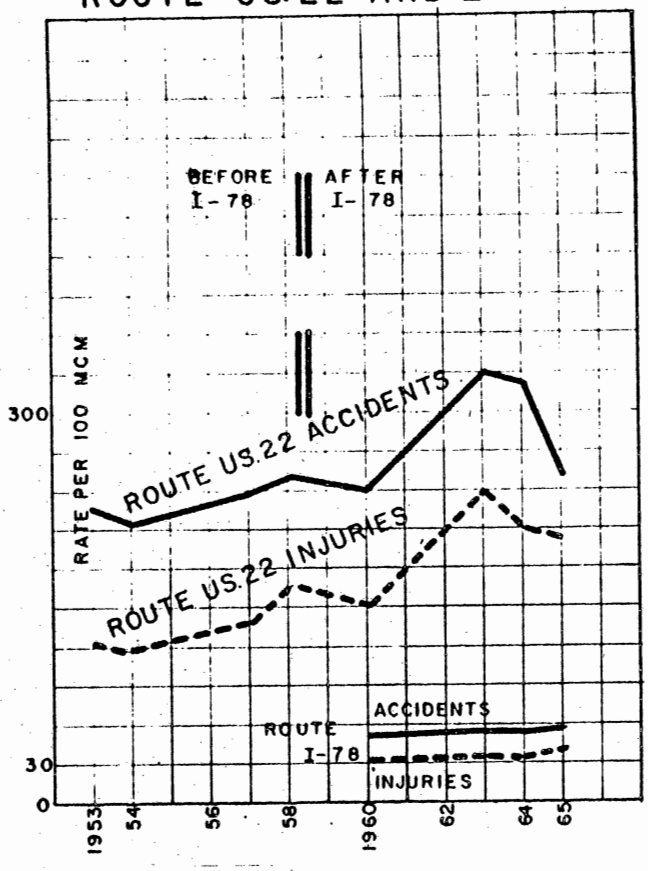
WHERE FREEWAYS HAVE BEEN BUILT PARALLEL TO OTHER MAJOR HIGHWAYS, ALTHOUGH THE ACCIDENT, INJURY AND FATALITY RATES ARE LOW ON THE FREEWAY, THE NUMBER OF ACCIDENTS, INJURIES AND FATALITIES DOES NOT SHOW THE SIGNIFICANT IMPROVEMENT FOR THE COMBINATION OF THE TWO ROUTES. IN FACT, THE INCREASE IN THE NUMBERS OF ACCIDENTS, INJURIES AND FATALITIES APPEARS TO BE STILL INCREASING BEYOND THE NUMBERS OCCURRING BEFORE THE CONSTRUCTION OF THE FREEWAY. THE RATES ON THE PARALLEL NON-FREEWAY HAVE INCREASED AFTER THE PROVISION OF THE PARALLEL FREEWAY.



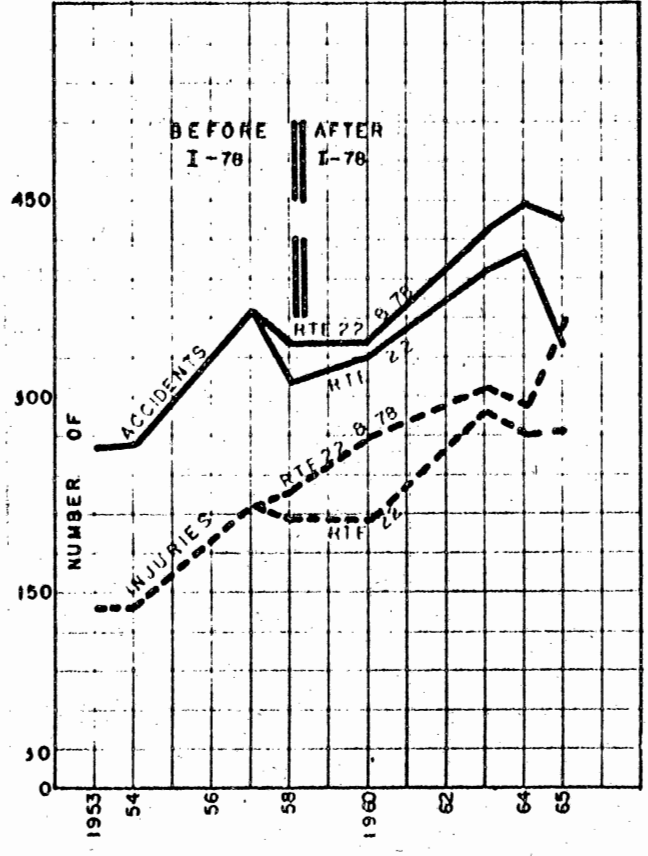
## SOMERSET COUNTY
### ACCIDENT, INJURY & FATALITY RATES



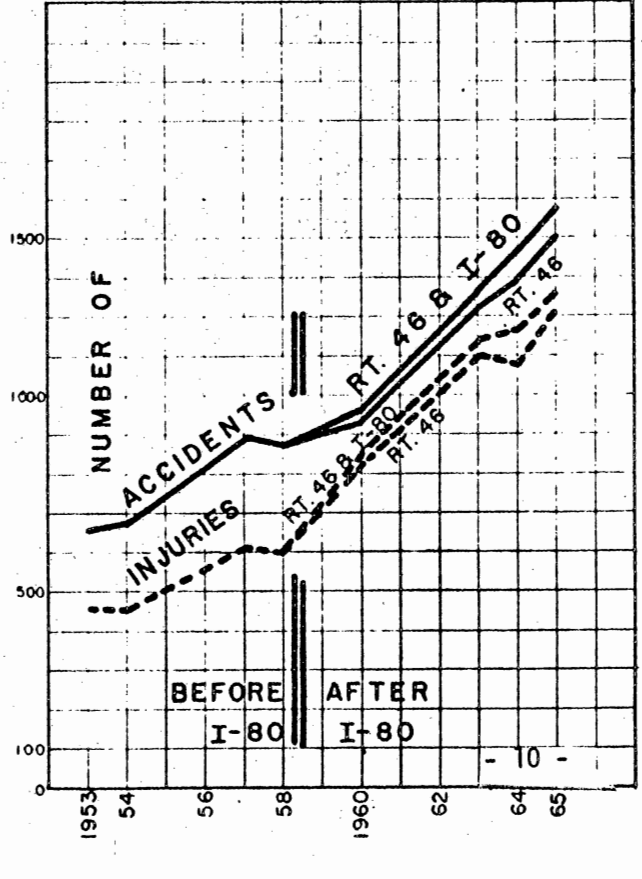

## WARREN AND HUNTERDON COUNTIES
### ROUTE US. 22 AND I-78




## WARREN AND HUNTERDON COUNTIES
### ROUTE US. 22 plus I-78




## MORRIS COUNTY
### ROUTE US 46 plus I-80



## 1966 INTERSTATE FATALITY RATES

| STATE | |
|---|---|
| ALABAMA | 2.99 |
| ALASKA | -- |
| ARIZONA | 5.60 |
| ARKANSAS | 5.22 |
| CALIFORNIA | 2.11 |
| COLORADO | 6.46 |
| CONNECTICUT | 2.05 |
| DELAWARE | 1.00 |
| FLORIDA | 2.13 |
| GEORGIA | 3.06 |
| HAWAII | 2.35 |
| IDAHO | 3.78 |
| ILLINOIS | 1.90 |
| INDIANA | 3.26 |
| IOWA | 3.69 |
| KANSAS | 5.03 |
| KENTUCKY | 4.46 |
| LOUISIANA | 6.95 |
| MAINE | 2.65 |
| MARYLAND | 1.98 |
| MASSACHUSETTS | 2.09 |
| MICHIGAN | 3.30 |
| MINNESOTA | 2.44 |
| MISSISSIPPI | 3.42 |
| MISSOURI | 4.50 |
| MONTANA | 4.69 |
| NEBRASKA | 3.31 |
| NEVADA | 6.60 |
| NEW HAMPSHIRE | 1.63 |
| NEW JERSEY | 2.33 |
| NEW MEXICO | 6.86 |
| NEW YORK | 2.21 |
| NORTH CAROLINA | 3.68 |
| NORTH DAKOTA | 3.41 |
| OHIO | 2.56 |
| OKLAHOMA | 3.03 |
| OREGON | 4.03 |
| PENNSYLVANIA | 2.04 |
| RHODE ISLAND | 1.68 |
| SOUTH CAROLINA | 3.57 |
| SOUTH DAKOTA | 3.24 |
| TENNESSEE | 4.37 |
| TEXAS | 4.12 |
| UTAH | 2.89 |
| VERMONT | 3.52 |
| VIRGINIA | 3.46 |
| WASHINGTON | 4.15 |
| WEST VIRGINIA | 5.07 |
| WISCONSIN | 3.68 |
| WYOMING | 7.56 |
| DIST. OF COLUMBIA | 3.37 |
| TOTAL | 3.09 |

| RANK | |
|---|---|
| WYOMING | 7.56 |
| LOUISIANA | 6.95 |
| NEW MEXICO | 6.86 |
| NEVADA | 6.60 |
| COLORADO | 6.46 |
| ARIZONA | 5.60 |
| ARKANSAS | 5.22 |
| WEST VIRGINIA | 5.07 |
| KANSAS | 5.03 |
| MONTANA | 4.69 |
| MISSOURI | 4.50 |
| KENTUCKY | 4.46 |
| TENNESSEE | 4.37 |
| WASHINGTON | 4.15 |
| TEXAS | 4.12 |
| OREGON | 4.03 |
| IDAHO | 3.78 |
| IOWA | 3.69 |
| WISCONSIN | 3.68 |
| NORTH CAROLINA | 3.68 |
| SOUTH CAROLINA | 3.57 |
| VERMONT | 3.52 |
| VIRGINIA | 3.46 |
| MISSISSIPPI | 3.42 |
| NORTH DAKOTA | 3.41 |
| DIST. OF COLUMBIA | 3.37 |
| NEBRASKA | 3.31 |
| MICHIGAN | 3.30 |
| INDIANA | 3.26 |
| SOUTH DAKOTA | 3.24 |
| GEORGIA | 3.06 |
| OKLAHOMA | 3.03 |
| ALABAMA | 2.99 |
| UTAH | 2.89 |
| MAINE | 2.65 |
| OHIO | 2.56 |
| MINNESOTA | 2.44 |
| HAWAII | 2.35 |
| NEW JERSEY | 2.33 |
| NEW YORK | 2.21 |
| FLORIDA | 2.13 |
| CALIFORNIA | 2.11 |
| MASSACHUSETTS | 2.09 |
| CONNECTICUT | 2.05 |
| PENNSYLVANIA | 2.04 |
| MARYLAND | 1.98 |
| ILLINOIS | 1.90 |
| RHODE ISLAND | 1.68 |
| NEW HAMPSHIRE | 1.63 |
| DELAWARE | 1.00 |
| ALASKA | -- |

Source: Bureau of Public Roads
Washington, D.C.

## U. S. TOLL ROADS

### FATALITY AND ACCIDENT RATES

NOTE:
UPPER FIGURE FATALITY RATE
LOWER FIGURE ACCIDENT RATE

| FACILITY | 1954 | 1955 | 1956 | 1957 | 1958 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| COLORADO: | | | | | | | | | | | |
| DENVER-BOULDER | | | -- | 2.9 | 0 | 8.5 | 7.8 | 3.7 | 3.5 | 1.6 | 3.9 |
| TURNPIKE | | | -- | 95.6 | 99.3 | 134.3 | 94.0 | 94.3 | 106.3 | 182.5 | 124.7 |
| CONNECTICUT: | | | | | | | | | | | |
| CONNECTICUT | | | | -- | 1.5 | 2.2 | 2.8 | 2.8 | 1.8 | 2.5 | 2.2 |
| TURNPIKE | | | | -- | 103.8 | 112.5 | 121.1 | 111.3 | 118.9 | 126.5 | 150.3 |
| MERRITT & WILBUR | 3.8 | 2.9 | 2.9 | | | 1.7 | 2.9 | 2.5 | 1.2 | 1.7 | 2.5 |
| CROSS PARKWAYS | 179. | 184. | 186.3 | | | 115.2 | 112.5 | 102.5 | 116.8 | 130.7 | 138.2 |
| DELAWARE TURNPIKE | | | | | | | | | | | |
| (JOHN F. KENNEDY | | | | | | | | -- | 1.4 | 0.0 | 1.1 |
| MEMORIAL HWY) | | | | | | | | -- | 143.1 | 108.9 | 78.7 |
| FLORIDA: | | | | | | | | | | | |
| SUNSHINE STATE | | | -- | 2.5 | 4.1 | 2.6 | 3.1 | 2.6 | 5.7 | 4.9 | 3.2 |
| PARKWAY | | | -- | 156. | 148.5 | 106.8 | 103.5 | 125.3 | 117.6 | 88.5 | 98.9 |
| AIRPORT EXPRESSWAY | | | | | | -- | 5.1 | .0 | 0.6 | 2.1 | 2.7 |
| & BUCCANEER TRAIL | | | | | | -- | 214.7 | 106.6 | 142.2 | 222.3 | 260.9 |
| ILLINOIS TOLLWAY | | | -- | -- | 4.6 | 2.1 | 1.6 | 1.5 | 2.0 | 1.2 | 1.9 |
| | | | -- | -- | 150.1 | 97.2 | 100.9 | 94.8 | 91.2 | 101.1 | 96.3 |
| INDIANA EAST-WEST | -- | -- | 5.3 | 2.6 | 4.6 | 1.2 | 1.8 | 3.3 | 2.1 | 1.1 | 3.6 |
| TOLL ROAD | -- | -- | 160.0 | 119.7 | 124.2 | 103.5 | 126.8 | 125.9 | 147.5 | 135.6 | 140.6 |
| KANSAS TURNPIKE | -- | -- | 2.8 | 5.9 | 8.1 | 4.8 | 5.7 | 6.6 | 6.4 | 7.1 | 9.7 |
| | -- | -- | 131.0 | 116. | 108.4 | 145.8 | 142.1 | 135.0 | 144.8 | 161.9 | 174.8 |

## U. S. TOLL ROADS

## FATALITY AND ACCIDENT RATES

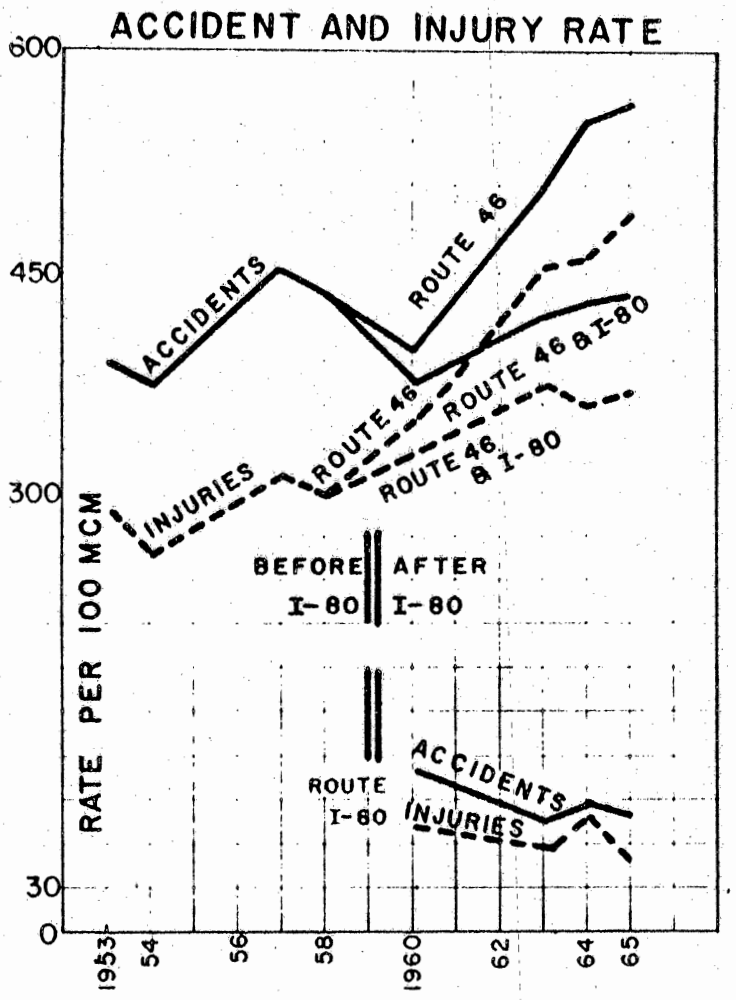
| FACILITY | 1954 | 1955 | 1956 | 1957 | 1958 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KENTUCKY: | | | | | | | | | | | |
| KENTUCKY TURNPIKE | -- | -- | 0.2 | -- | 6.0 | 2.8 | 3.3 | 3.7 | 4.3 | 2.4 | 6.7 |
| | -- | -- | 3.2 | -- | 57.4 | 99.4 | 46.8 | 90.4 | 89.0 | 94.5 | 104.4 |
| MOUNTAIN PARKWAY | | | | | | | | -- | 7.1 | 9.2 | 12.2 |
| | | | | | | | | -- | 92.2 | 47.8 | 67.8 |
| WESTERN PARKWAY | | | | | | | | -- | 1.2 | 5.8 | 10.7 |
| | | | | | | | | -- | 84.1 | 98.5 | 85.3 |
| MAINE TURNPIKE | 1.1 | 7.0 | 4.3 | 2.1 | 1.6 | 4.1 | 0.0 | 5.1 | 0.8 | 2.1 | 2.3 |
| | 92. | 115. | 176. | 128. | 121.9 | 124.6 | 139.0 | 130.4 | 153.6 | 144.3 | 129.9 |
| MARYLAND: | | | | | | | | | | | |
| JOHN F. KENNEDY | | | | | | | | -- | .0 | 1.3 | 1.9 |
| MEMORIAL HIGHWAY | | | | | | | | -- | 111.7 | 90.2 | 93.1 |
| MASSACHUSETTS TPK. | | | -- | 3.3 | 3.2 | 2.3 | 1.7 | 2.3 | 2.9 | 2.7 | 1.8 |
| | | | -- | 133.3 | 165.9 | 120.6 | 102.7 | 97.6 | 95.3 | 91.8 | 83.9 |
| NEW HAMPSHIRE TPK. | 0 | 2.0 | 0.0 | 0.0 | 3.4 | 2.1 | 3.4 | 6.4 | 3.9 | 2.5 | 2.7 |
| | 77.0 | 124. | 124. | 83.7 | 125.1 | 109.4 | 107.7 | 101.4 | 68.1 | 60.5 | 56.0 |
| NEW JERSEY: | | | | | | | | | | | |
| ATLANTIC CITY | | | | | | | | -- | 2.9 | 4.7 | 5.4 |
| EXPRESSWAY | | | | | | | | -- | 209.4 | 126.8 | 148.2 |
| GARDEN STATE | -- | 1.2 | 1.3 | 1.3 | 1.0 | 0.66 | 1.4 | 0.7 | 1.4 | 1.2 | 1.7 |
| PARKWAY | -- | 58.2 | 69.1 | 65.1 | 64.2 | 90.9 | 91.9 | 96.5 | 104.1 | 104.2 | 95.1 |
| NEW JERSEY | 2.5 | 2.8 | 2.3 | 2.0 | 2.4 | 1.4 | 2.2 | 2.1 | 1.6 | 1.6 | 1.7 |
| TURNPIKE | 102. | 122. | 94.0 | 86.6 | 81.0 | 89.3 | 89.8 | 82.2 | 94.3 | 91.8 | 88.0 |

## U. S. TOLL ROADS

## FATALITY AND ACCIDENT RATES

| FACILITY | 1954 | 1955 | 1956 | 1957 | 1958 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NEW YORK:' | | | | | | | | | | | |
| HUTCHINSON RIVER | | | | | | | | 1.0 | 0.8 | 0.8 | 0.0 |
| PARKWAY | 3.3 | 2.4 | 4.0 | | | | | 180.5 | 140.9 | 192.1 | 163.5 |
| | 239.2 | 269.1 | 275.1 | | | | | | | | |
| SAW MILL RIVER | | | | | | | | 3.6 | 8.2 | 6.4 | 2.1 |
| PARKWAY | | | | | | | | 207.9 | 208.0 | 268.3 | 256.3 |
| NEW YORK STATE | 2.4 | 2.8 | 2.7 | 1.9 | 0.9 | 2.6 | 2.7 | 2.2 | 2.7 | 3.1 | 3.1 |
| THRUWAY | 206.8 | 218.8 | 199.5 | 191.2 | 96.0 | 133.0 | 144.5 | 144.8 | 139.2 | 138.6 | 135.5 |
| OHIO TURNPIKE | 0 | 3.0 | 1.9 | 3.1 | 3.2 | 2.3 | 1.2 | 1.5 | 3.0 | 2.6 | 3.1 |
| | 3.6 | 188.9 | 139.5 | 85.0 | 104.8 | 104.4 | 108.6 | 71.6 | 83.3 | 85.3 | 93.4 |
| OKLAHOMA TURNPIKE | | | | | | | | | | | |
| (WILL ROGERS & | 4.9 | 8.7 | 2.8 | 3.4 | 9.1 | 1.9 | 5.0 | 3.2 | 2.5 | 3.9 | 3.9 |
| TURNER TPKS) | 103.3 | 88.7 | 77.2 | 69.0 | 70.5 | 72.7 | 80.9 | 71.1 | 65.6 | 68.2 | 67.8 |
| PENNSYLVANIA TPK. | 4.2 | 6.4 | 4.6 | 3.3 | 4.1 | 3.3 | 3.7 | 2.6 | 2.4 | 1.5 | 2.4 |
| | 108.7 | 116.7 | 101.9 | 104.1 | 93.7 | 92.0 | 111.6 | 101.1 | 109.2 | 80.6 | 150.3 |
| TEXAS: | | | | | | | | | | | |
| DALLAS-FORT WORTH | | | -- | 0 | 4.1 | 3.7 | 1.2 | 3.3 | 2.5 | 0.9 | 2.6 |
| TPK. | | | -- | 16.0 | 85.3 | 24.1 | 123.8 | 119.6 | 142.7 | 126.7 | 147.0 |
| VIRGINIA: | | | | | | | | | | | |
| RICHMOND-PETERSBURG | | | -- | -- | 0 | 3.1 | 1.2 | 3.7 | 0.9 | 1.2 | 4.8 |
| TPK. | | | -- | -- | 103.2 | 78.7 | 121.1 | 105.4 | 109.6 | 109.6 | 110.2 |
| WEST VIRGINIA | -- | 13.4 | 8.5 | 14.0 | 8.0 | 14.0 | 11.5 | 8.7 | 15.6 | 18.1 | 10.8 |
| TURNPIKE | -- | 220.1 | 161.7 | 149. | 184.9 | 211.6 | 190.5 | 170.3 | 166.2 | 149.4 | 175.5 |

**SOURCE:** INTERNATIONAL BRIDGE, TUNNEL AND TURNPIKE ASSOCIATION, INC.




IN MANY CASES, CREDIT HAS BEEN TAKEN FOR MINOR IMPROVEMENTS OF SHORT SECTIONS OF ROAD. FOR EXAMPLE, A 10 PERCENT REDUCTION IN ACCIDENT EXPERIENCE ON 1 PERCENT OF A TOTAL ROAD SYSTEM. DURING THE LENGTH OF TIME REQUIRED TO MAKE THE IMPROVEMENTS, THE OVERALL ACCIDENT EXPERIENCE PROBABLY INCREASED SO THAT THE GAIN ON THE SMALL SECTION WOULD BE INSIGNIFICANT ON THE OVERALL AREA.

## 3.4 ACCIDENTS

ALTHOUGH THE GROWING TRAFFIC VOLUMES CREATE PROBLEMS OF CONGESTION WHICH IS A MAJOR SOURCE OF COMPLAINT BY THE AVERAGE DRIVER, THE INCREASING NUMBERS OF ACCIDENTS, INJURIES AND FATALITIES ARE OF MUCH GREATER SIGNIFICANCE. THE GENERAL ATTITUDE IS THAT ACCIDENTS ARE THE FAULT OF INDIVIDUALS AND, THEREFORE, ARE THE RESPONSIBILITY OF THE INDIVIDUAL; WHEREAS CONGESTION IS THE RESPONSIBILITY OF GOVERNMENT.

## 3.5 CAPACITY

A GRID SYSTEM OF STREETS IS NOT CONDUCIVE TO LARGE CAPACITIES. AT THE INTERSECTION OF TWO CROSS STREETS, THERE IS CAPACITY ENOUGH FOR ONLY ONE OF THESE STREETS, THEREFORE, THE EFFECTIVE CAPACITY OF EACH STREET IS REDUCED BY 50 PERCENT. WHERE RADIAL STREETS ARE SUPERIMPOSED UPON A GRID SYSTEM, THE CAPACITY OF THE INTERSECTION IS STILL EQUAL TO THE CAPACITY OF ONE STREET. THE EFFECTIVE CAPACITY OF EACH OF THE FOUR STREETS, THEREFORE, IS REDUCED TO 25 PERCENT OF ITS POTENTIAL.

IT HAS BEEN ESTABLISHED THAT THE AVERAGE FAMILY IN THE UNITED STATES MOVES EVERY FIVE YEARS. AT THIS RATE THEN, THE EQUIVALENT OF EVERYONE IN THE UNITED STATES HAS MOVED IN TWENTY YEARS./1 IT MUST BE NOTED ALSO THAT THE CURRENT TREND IS TO ACCELERATE URBAN RENEWAL. A FURTHER SYSTEMATIC LARGE SCALE ADJUSTMENT COULD, THEREFORE, BE CONSIDERED A LOGICAL EXPANSION OF CURRENT ESTABLISHED TRENDS.

WE HAVE BEEN LOSING GROUND CONTINUALLY IN OUR ATTEMPT TO PROVIDE GREATER CAPACITY FOR OUR EXISTING STREET NETWORKS. DURING RUSH HOUR IT TAKES JUST AS LONG TODAY TO CROSS MANHATTAN IN NEW YORK CITY WITH OUR MANY HORSE-POWERED AUTOMOBILES AS IT DID IN 1897, 70 YEARS AGO, WITH HORSE-DRAWN BUGGYS. THIS IS ALSO TRUE IN MANY OF OUR OTHER OLDER CITIES. DURING THE TIME ELAPSED IN MAKING A TOKEN IMPROVEMENT IN CAPACITY, THE PROBLEM INCREASES MUCH FASTER THAN THE IMPROVEMENT CAN BE MADE. IT IS QUITE COMMON TO EXPRESS PRIDE IN SMALL IMPROVEMENTS; FOR EXAMPLE, A 10 PERCENT INCREASE IN CAPACITY ON A 1-1/2 MILE LENGTH OF ONE STREET OUT OF AN 1100 MILE SYSTEM IN A CITY.

## 3.6 NEW JERSEY FIRST /2

NEW JERSEY IS THE MOST DENSELY POPULATED STATE IN THE COUNTRY; HAS THE MOST DENSELY POPULATED MUNICIPALITY IN THE COUNTRY; HAS THE MOST TRAFFIC PER MILE

/1 Page 16
/2 Pages 17-21

IN THOUSANDS

U. S. MOBILITY STATUS

| YEAR 19- | TOTAL CIVILIAN POPULATION | SAME HOUSE NON-MOVER | DIFFERENT HOUSE IN U.S. - MOVER | SAME COUNTY | DIFFERENT COUNTY | WITHIN A STATE | BETWEEN STATES | ABROAD AT BEGINNING CK. PERIOD |
|---|---|---|---|---|---|---|---|---|
| 56 | 164,371 | 131,648 | 31,834 | 21,566 | 10,268 | 5,192 | 5,076 | 889 |
| 57 | 167,604 | 133,501 | 33,263 | 22,023 | 11,240 | 5,656 | 5,584 | 840 |
| 58 | 170,658 | 137,018 | 32,804 | 22,315 | 10,489 | 5,419 | 5,070 | 836 |
| 59 | 174,451 | 139,766 | 33,811 | 22,564 | 11,247 | 5,724 | 5,523 | 874 |
| 60 | 177,354 | 140,821 | 35,535 | 24,289 | 11,246 | 5,493 | 5,753 | 998 |
| 61 | 179,663 | 144,445 | 34,364 | 23,341 | 11,023 | 5,461 | 5,562 | 854 |
| 62 | 182,542 | 146,109 | 35,411 | 23,059 | 12,352 | 5,711 | 6,641 | 1,021 |

SOURCE: HISTORICAL STATISTICS
OF THE UNITED STATES- 1962

## ESTIMATED POPULATION - 1964*

| | STATE | | | PER | SQ. MI. | ACRE |
|---|---|---|---|---|---|---|
| (26) | Alabama | 3,407,000 | | District of Columbia | 11710.1 | 18.3 |
| (50) | Alaska | 250,000 | (1) | NEW JERSEY | 852.7 | 1.3 |
| (41) | Arizona | 1,581,000 | (2) | Rhode Island | 752.9 | 1.2 |
| (34) | Arkansas | 1,933,000 | (3) | Massachusetts | 646.5 | 1.0 |
| (13) | California | 18,084,000 | (4) | Connecticut | 552.2 | 0.86 |
| (40) | Colorado | 1,966,000 | (5) | New York | 361.3 | 0.56 |
| (4) | Connecticut | 2,766,000 | (6) | Maryland | 324.5 | 0.50 |
| (9) | Delaware | 491,000 | (7) | Pennsylvania | 252.8 | 0.39 |
| (16) | Florida | 5,705,000 | (8) | Ohio | 245.0 | 0.38 |
| (23) | Georgia | 4,294,000 | (9) | Delaware | 238.7 | 0.37 |
| (14) | Hawaii | 701,000 | (10) | Illinois | 186.0 | 0.29 |
| (45) | Idaho | 692,000 | (11) | Michigan | 139.1 | 0.21 |
| (10) | Illinois | 10,489,000 | (12) | Indiana | 132.9 | 0.20 |
| (12) | Indiana | 4,825,000 | (13) | California | 113.9 | 0.17 |
| (28) | Iowa | 2,756,000 | (14) | Hawaii | 109.1 | 0.17 |
| (37) | Kansas | 2,225,000 | (15) | Virginia | 107.3 | 0.16 |
| (20) | Kentucky | 3,159,000 | (16) | Florida | 97.4 | 0.15 |
| (24) | Louisiana | 3,468,000 | (17) | North Carolina | 92.0 | 0.14 |
| (36) | Maine | 989,000 | (18) | Tennessee | 89.9 | 0.14 |
| (6) | Maryland | 3,432,000 | (19) | South Carolina | 82.3 | 0.12 |
| (3) | Massachusetts | 5,338,000 | (20) | Kentucky | 78.2 | 0.12 |
| (11) | Michigan | 8,098,000 | (21) | West Virginia | 74.3 | 0.11 |
| (32) | Minnesota | 3,521,000 | (22) | Wisconsin | 73.1 | 0.11 |
| (29) | Mississippi | 2,314,000 | (23) | Georgia | 72.9 | 0.11 |
| (27) | Missouri | 4,409,000 | (24) | Louisiana | 71.5 | 0.11 |
| (47) | Montana | 705,000 | (25) | New Hampshire | 70.3 | 0.10 |
| (39) | Nebraska | 1,480,000 | (26) | Alabama | 66.0 | 0.10 |
| (48) | Nevada | 408,000 | (27) | Missouri | 63.3 | 0.098 |
| (25) | New Hampshire | 654,000 | (28) | Iowa | 49.0 | 0.076 |
| (1) | NEW JERSEY | 6,682,000 | (29) | Mississippi | 48.5 | 0.075 |
| (46) | New Mexico | 1,008,000 | (30) | Washington | 43.7 | 0.068 |
| (5) | New York | 17,915,000 | (31) | Vermont | 42.6 | 0.066 |
| (17) | North Carolina | 4,852,000 | (32) | Minnesota | 41.9 | 0.065 |
| (44) | North Dakota | 645,000 | (33) | Texas | 38.9 | 0.060 |
| (8) | Ohio | 10,100,000 | (34) | Arkansas | 36.4 | 0.056 |
| (35) | Oklahoma | 2,465,000 | (35) | Oklahoma | 35.2 | 0.055 |
| (38) | Oregon | 1,871,000 | (36) | Maine | 29.8 | 0.046 |
| (7) | Pennsylvania | 11,459,000 | (37) | Kansas | 27.0 | 0.042 |
| (2) | Rhode Island | 914,000 | (38) | Oregon | 19.2 | 0.030 |
| (19) | South Carolina | 2,555,000 | (39) | Nebraska | 19.1 | 0.029 |
| (43) | South Dakota | 715,000 | (40) | Colorado | 18.9 | 0.029 |
| (18) | Tennessee | 3,798,000 | (41) | Arizona | 13.9 | 0.021 |
| (33) | Texas | 10,397,000 | (42) | Utah | 11.7 | 0.018 |
| (42) | Utah | 992,000 | (43) | South Dakota | 9.3 | 0.014 |
| (31) | Vermont | 409,000 | (44) | North Dakota | 9.1 | 0.014 |
| (15) | Virginia | 4,378,000 | (45) | Idaho | 8.3 | 0.012 |
| (30) | Washington | 2,984,000 | (46) | New Mexico | 8.3 | 0.012 |
| (21) | West Virginia | 1,797,000 | (47) | Montana | 4.8 | 0.007 |
| (22) | Wisconsin | 4,107,000 | (48) | Nevada | 3.6 | 0.005 |
| (49) | Wyoming | 343,000 | (49) | Wyoming | 3.5 | 0.005 |
| | District of Columbia | 808,000 | (50) | Alaska | 0.4 | 0.0006 |
| | TOTAL | 191,334,000 | | | 52.93 | .083 |

* Source - Statistical Abstract of the United States - 1965

## REGISTRATIONS - 1964
## ALL MOTOR VEHICLES*

| | STATE | |
|---|---|---|
| (24) | Alabama | 1,558,522 |
| (50) | Alaska | 101,916 |
| (41) | Arizona | 791,926 |
| (35) | Arkansas | 873,172 |
| (13) | California | 9,539,181 |
| (40) | Colorado | 1,113,268 |
| (3) | Connecticut | 1,343,459 |
| (7) | Delaware | 234,721 |
| (14) | Florida | 2,852,371 |
| (22) | Georgia | 1,891,227 |
| (15) | Hawaii | 288,971 |
| (45) | Idaho | 419,595 |
| (10) | Illinois | 4,259,433 |
| (12) | Indiana | 2,321,717 |
| (28) | Iowa | 1,486,268 |
| (36) | Kansas | 1,328,309 |
| (19) | Kentucky | 1,418,821 |
| (26) | Louisiana | 1,365,744 |
| (37) | Maine | 409,499 |
| (5) | Maryland | 1,394,475 |
| (4) | Massachusetts | 2,031,519 |
| (11) | Michigan | 3,758,748 |
| (30) | Minnesota | 1,788,675 |
| (33) | Mississippi | 870,295 |
| (25) | Missouri | 2,030,186 |
| (47) | Montana | 426,133 |
| (39) | Nebraska | 832,261 |
| (49) | Nevada | 245,640 |
| (20) | New Hampshire | 317,809 |
| (1) | NEW JERSEY | 2,861,104 |
| (46) | New Mexico | 507,482 |
| (6) | New York | 5,726,685 |
| (17) | North Carolina | 2,030,628 |
| (43) | North Dakota | 384,862 |
| (8) | Ohio | 4,670,976 |
| (32) | Oklahoma | 1,380,217 |
| (38) | Oregon | 1,065,571 |
| (9) | Pennsylvania | 4,817,482 |
| (2) | Rhode Island | 389,574 |
| (21) | South Carolina | 1,029,638 |
| (44) | South Dakota | 390,173 |
| (18) | Tennessee | 1,573,437 |
| (31) | Texas | 5,312,169 |
| (42) | Utah | 504,726 |
| (34) | Vermont | 168,207 |
| (16) | Virginia | 1,707,076 |
| (29) | Washington | 1,581,764 |
| (27) | West Virginia | 660,306 |
| (23) | Wisconsin | 1,801,963 |
| (48) | Wyoming | 223,404 |
| | District of Columbia | 227,293 |
| | TOTAL | 86,309,098 |

| | PER | SQ. MI. | ACRE |
|---|---|---|---|
| | District of Columbia | 3294.1 | 5.1470 |
| (1) | NEW JERSEY | 365.1 | 0.5705 |
| (2) | Rhode Island | 320.9 | 0.5014 |
| (3) | Connecticut | 268.2 | 0.4190 |
| (4) | Massachusetts | 246.0 | 0.3844 |
| (5) | Maryland | 131.8 | 0.2060 |
| (6) | New York | 115.5 | 0.1804 |
| (7) | Delaware | 114.1 | 0.1782 |
| (8) | Ohio | 113.3 | 0.1770 |
| (9) | Pennsylvania | 106.3 | 0.1660 |
| (10) | Illinois | 75.5 | 0.1180 |
| (11) | Michigan | 64.6 | 0.1008 |
| (12) | Indiana | 64.0 | 0.0999 |
| (13) | California | 60.1 | 0.0939 |
| (14) | Florida | 48.7 | 0.0761 |
| (15) | Hawaii | 45.0 | 0.0702 |
| (16) | Virginia | 41.8 | 0.0653 |
| (17) | North Carolina | 38.5 | 0.0601 |
| (18) | Tennessee | 37.2 | 0.0581 |
| (19) | Kentucky | 35.1 | 0.0548 |
| (20) | New Hampshire | 34.2 | 0.0533 |
| (21) | South Carolina | 33.2 | 0.0518 |
| (22) | Georgia | 32.1 | 0.0501 |
| (23) | Wisconsin | 32.1 | 0.0501 |
| (24) | Alabama | 30.2 | 0.0471 |
| (25) | Missouri | 29.1 | 0.0455 |
| (26) | Louisiana | 28.1 | 0.0439 |
| (27) | West Virginia | 27.3 | 0.0426 |
| (28) | Iowa | 26.4 | 0.0412 |
| (29) | Washington | 23.2 | 0.0362 |
| (30) | Minnesota | 21.3 | 0.0330 |
| (31) | Texas | 19.9 | 0.0310 |
| (32) | Oklahoma | 19.7 | 0.0308 |
| (33) | Mississippi | 18.2 | 0.0284 |
| (34) | Vermont | 17.5 | 0.0273 |
| (35) | Arkansas | 16.4 | 0.0256 |
| (36) | Kansas | 16.1 | 0.0252 |
| (37) | Maine | 12.3 | 0.0192 |
| (38) | Oregon | 11.0 | 0.0171 |
| (39) | Nebraska | 10.8 | 0.0168 |
| (40) | Colorado | 10.7 | 0.0166 |
| (41) | Arizona | 7.0 | 0.0108 |
| (42) | Utah | 5.9 | 0.0092 |
| (43) | North Dakota | 5.4 | 0.0085 |
| (44) | South Dakota | 5.1 | 0.0079 |
| (45) | Idaho | 5.0 | 0.0078 |
| (46) | New Mexico | 4.2 | 0.0065 |
| (47) | Montana | 2.9 | 0.0045 |
| (48) | Wyoming | 2.3 | 0.0035 |
| (49) | Nevada | 2.2 | 0.0034 |
| (50) | Alaska | 0.2 | 0.0002 |
| | TOTAL | 23.88 | .037 |

* Source - Highway Statistics - 1964

## AVERAGE DAILY TRAFFIC PER MILE OF STATE PRIMARY SYSTEM

### STATE

| | | |
|---|---|---|
| (26) | Alabama | 2,401 |
| (50) | Alaska | 516 |
| (23) | Arizona | 2,560 |
| (39) | Arkansas | 1,519 |
| (6) | California | 7,049 |
| (35) | Colorado | 1,871 |
| (2) | Connecticut | 10,803 |
| (5) | Delaware | 7,129 |
| (13) | Florida | 4,152 |
| (32) | Georgia | 2,066 |
| (8) | Hawaii | 5,413 |
| (42) | Idaho | 1,353 |
| (12) | Illinois | 4,261 |
| (10) | Indiana | 4,706 |
| (33) | Iowa | 2,042 |
| (37) | Kansas | 1,685 |
| (41) | Kentucky | 1,415 |
| (11) | Louisiana | 4,476 |
| (34) | Maine | 1,993 |
| (3) | Maryland | 9,414 |
| (4) | Massachusetts | 8,260 |
| (9) | Michigan | 4,837 |
| (30) | Minnesota | 2,189 |
| (38) | Mississippi | 1,583 |
| (18) | Missouri | 3,093 |
| (45) | Montana | 1,109 |
| (43) | Nebraska | 1,218 |
| (16) | Nevada | 3,605 |
| (29) | New Hampshire | 2,233 |
| (1) | NEW JERSEY | 13,322 |
| (44) | New Mexico | 1,163 |
| (17) | New York | 3,486 |
| (24) | North Carolina | 2,529 |
| (49) | North Dakota | 845 |
| (19) | Ohio | 3,065 |
| (28) | Oklahoma | 2,255 |
| (21) | Oregon | 2,994 |
| (15) | Pennsylvania | 3,628 |
| (7) | Rhode Island | 6,019 |
| (31) | South Carolina | 2,179 |
| (48) | South Dakota | 882 |
| (22) | Tennessee | 2,758 |
| (46) | Texas | 953 |
| (36) | Utah | 1,799 |
| (40) | Vermont | 1,450 |
| (14) | Virginia | 3,784 |
| (20) | Washington | 3,007 |
| (25) | West Virginia | 2,409 |
| (27) | Wisconsin | 2,329 |
| (47) | Wyoming | 952 |
| | TOTAL | 2,578 |

### RANK

| | | |
|---|---|---|
| (1) | NEW JERSEY | 13,322 |
| (2) | Connecticut | 10,803 |
| (3) | Maryland | 9,414 |
| (4) | Massachusetts | 8,260 |
| (5) | Delaware | 7,129 |
| (6) | California | 7,049 |
| (7) | Rhode Island | 6,019 |
| (8) | Hawaii | 5,413 |
| (9) | Michigan | 4,837 |
| (10) | Indiana | 4,706 |
| (11) | Louisiana | 4,476 |
| (12) | Illinois | 4,261 |
| (13) | Florida | 4,152 |
| (14) | Virginia | 3,784 |
| (15) | Pennsylvania | 3,628 |
| (16) | Nevada | 3,605 |
| (17) | New York | 3,486 |
| (18) | Missouri | 3,093 |
| (19) | Ohio | 3,065 |
| (20) | Washington | 3,007 |
| (21) | Oregon | 2,994 |
| (22) | Tennessee | 2,758 |
| (23) | Arizona | 2,560 |
| (24) | North Carolina | 2,529 |
| (25) | West Virginia | 2,409 |
| (26) | Alabama | 2,401 |
| (27) | Wisconsin | 2,329 |
| (28) | Oklahoma | 2,255 |
| (29) | New Hampshire | 2,233 |
| (30) | Minnesota | 2,189 |
| (31) | South Carolina | 2,179 |
| (32) | Georgia | 2,066 |
| (33) | Iowa | 2,042 |
| (34) | Maine | 1,993 |
| (35) | Colorado | 1,871 |
| (36) | Utah | 1,799 |
| (37) | Kansas | 1,685 |
| (38) | Mississippi | 1,583 |
| (39) | Arkansas | 1,519 |
| (40) | Vermont | 1,450 |
| (41) | Kentucky | 1,415 |
| (42) | Idaho | 1,353 |
| (43) | Nebraska | 1,218 |
| (44) | New Mexico | 1,163 |
| (45) | Montana | 1,109 |
| (46) | Texas | 953 |
| (47) | Wyoming | 952 |
| (48) | South Dakota | 882 |
| (49) | North Dakota | 845 |
| (50) | Alaska | 516 |
| | | 2,578 |

## TAXABLE GALLONS OF FUEL PER TOTAL EXISTING ROAD MILEAGE - 1964 *

| | STATE | PER YR. | PER DAY |
|---|---|---|---|
| (27) | Alabama | 16,081 | 44 |
| (32) | Alaska | 14,963 | 41 |
| (22) | Arizona | 17,455 | 47 |
| (41) | Arkansas | 9,573 | 26 |
| (7) | California | 46,796 | 128 |
| (40) | Colorado | 10,348 | 28 |
| (4) | Connecticut | 55,213 | 151 |
| (8) | Delaware | 44,893 | 123 |
| (13) | Florida | 28,533 | 78 |
| (23) | Georgia | 17,263 | 47 |
| (5) | Hawaii | 53,425 | 146 |
| (43) | Idaho | 7,959 | 21 |
| (12) | Illinois | 28,773 | 78 |
| (18) | Indiana | 19,788 | 54 |
| (35) | Iowa | 11,845 | 32 |
| (42) | Kansas | 8,307 | 22 |
| (28) | Kentucky | 15,850 | 43 |
| (16) | Louisiana | 23,153 | 63 |
| (20) | Maine | 18,310 | 50 |
| (6) | Maryland | 50,346 | 137 |
| (2) | Massachusetts | 61,716 | 169 |
| (14) | Michigan | 27,986 | 76 |
| (34) | Minnesota | 12,121 | 33 |
| (33) | Mississippi | 12,342 | 33 |
| (24) | Missouri | 16,888 | 46 |
| (47) | Montana | 4,723 | 12 |
| (45) | Nebraska | 6,760 | 18 |
| (46) | Nevada | 5,373 | 14 |
| (26) | New Hampshire | 16,456 | 45 |
| (1) | NEW JERSEY | 72,562 | 198 |
| (44) | New Mexico | 7,500 | 20 |
| (9) | New York | 42,789 | 117 |
| (17) | North Carolina | 21,830 | 59 |
| (49) | North Dakota | 3,402 | 9 |
| (10) | Ohio | 35,007 | 95 |
| (39) | Oklahoma | 10,465 | 28 |
| (38) | Oregon | 10,673 | 29 |
| (11) | Pennsylvania | 33,565 | 91 |
| (3) | Rhode Island | 60,752 | 166 |
| (30) | South Carolina | 15,404 | 42 |
| (48) | South Dakota | 4,493 | 12 |
| (21) | Tennessee | 18,229 | 49 |
| (19) | Texas | 19,595 | 53 |
| (36) | Utah | 10,943 | 29 |
| (37) | Vermont | 10,899 | 29 |
| (15) | Virginia | 26,750 | 73 |
| (25) | Washington | 16,521 | 45 |
| (29) | West Virginia | 15,840 | 43 |
| (31) | Wisconsin | 15,365 | 42 |
| (50) | Wyoming | 3,129 | 8 |
| | Dist. of Columbia | 175,304 | 480 |
| | TOTAL | 19,543 | 54 |

| | RANK | PER YR. | PER DAY |
|---|---|---|---|
| | Dist. of Columbia | 175,304 | 480 |
| (1) | NEW JERSEY | 72,562 | 198 |
| (2) | Massachusetts | 61,716 | 169 |
| (3) | Rhode Island | 60,752 | 166 |
| (4) | Connecticut | 55,213 | 151 |
| (5) | Hawaii | 53,425 | 146 |
| (6) | Maryland | 50,346 | 137 |
| (7) | California | 46,796 | 128 |
| (8) | Delaware | 44,893 | 123 |
| (9) | New York | 42,789 | 117 |
| (10) | Ohio | 35,007 | 95 |
| (11) | Pennsylvania | 33,565 | 91 |
| (12) | Illinois | 28,773 | 78 |
| (13) | Florida | 28,533 | 78 |
| (14) | Michigan | 27,986 | 76 |
| (15) | Virginia | 26,750 | 73 |
| (16) | Louisiana | 23,153 | 63 |
| (17) | North Carolina | 21,830 | 59 |
| (18) | Indiana | 19,788 | 54 |
| (19) | Texas | 19,595 | 53 |
| (20) | Maine | 18,310 | 50 |
| (21) | Tennessee | 18,229 | 49 |
| (22) | Arizona | 17,455 | 47 |
| (23) | Georgia | 17,263 | 47 |
| (24) | Missouri | 16,888 | 46 |
| (25) | Washington | 16,521 | 45 |
| (26) | New Hampshire | 16,456 | 45 |
| (27) | Alabama | 16,081 | 44 |
| (28) | Kentucky | 15,850 | 43 |
| (29) | West Virginia | 15,840 | 43 |
| (30) | South Carolina | 15,404 | 42 |
| (31) | Wisconsin | 15,365 | 42 |
| (32) | Alaska | 14,963 | 41 |
| (33) | Mississippi | 12,342 | 33 |
| (34) | Minnesota | 12,121 | 33 |
| (35) | Iowa | 11,845 | 32 |
| (36) | Utah | 10,943 | 29 |
| (37) | Vermont | 10,899 | 29 |
| (38) | Oregon | 10,673 | 29 |
| (39) | Oklahoma | 10,465 | 28 |
| (40) | Colorado | 10,348 | 28 |
| (41) | Arkansas | 9,573 | 26 |
| (42) | Kansas | 8,307 | 22 |
| (43) | Idaho | 7,959 | 21 |
| (44) | New Mexico | 7,500 | 20 |
| (45) | Nebraska | 6,760 | 18 |
| (46) | Nevada | 5,373 | 14 |
| (47) | Montana | 4,723 | 12 |
| (48) | South Dakota | 4,493 | 12 |
| (49) | North Dakota | 3,402 | 9 |
| (50) | Wyoming | 3,129 | 8 |
| | TOTAL | 19,543 | 54 |

* AADT Volume per mile of total roads and streets should have the same ranking.

## ROADWAY MILEAGE PER

| | STATE | ACRE | SQ. MI. |
|---|---|---|---|
| 27) | Alabama | 0.0023 | 1.48 |
| 50) | Alaska | 0.0000 | 0.01 |
| (49) | Arizona | 0.0005 | 0.34 |
| 24) | Arkansas | 0.0023 | 1.51 |
| 37) | California | 0.0015 | 0.98 |
| (40) | Colorado | 0.0011 | 0.76 |
| (3) | Connecticut | 0.0054 | 3.48 |
| (8) | Delaware | 0.0036 | 2.32 |
| 33) | Florida | 0.0020 | 1.31 |
| (19) | Georgia | 0.0025 | 1.63 |
| 44) | Hawaii | 0.0007 | 0.51 |
| 46) | Idaho | 0.0007 | 0.50 |
| (9) | Illinois | 0.0035 | 2.26 |
| (5) | Indiana | 0.0045 | 2.88 |
| 12) | Iowa | 0.0031 | 1.99 |
| (20) | Kansas | 0.0025 | 1.61 |
| 17) | Kentucky | 0.0027 | 1.73 |
| 35) | Louisiana | 0.0016 | 1.03 |
| 42) | Maine | 0.0009 | 0.63 |
| (10) | Maryland | 0.0034 | 2.18 |
| (4) | Massachusetts | 0.0051 | 3.27 |
| 13) | Michigan | 0.0030 | 1.94 |
| (26) | Minnesota | 0.0023 | 1.49 |
| 31) | Mississippi | 0.0021 | 1.36 |
| 18) | Missouri | 0.0025 | 1.64 |
| (45) | Montana | 0.0007 | 0.51 |
| 32) | Nebraska | 0.0020 | 1.33 |
| 48) | Nevada | 0.0006 | 0.42 |
| 22) | New Hampshire | 0.0024 | 1.55 |
| (1) | NEW JERSEY | 0.0064 | 4.14 |
| 43) | New Mexico | 0.0008 | 0.54 |
| 1) | New York | 0.0032 | 2.05 |
| (21) | North Carolina | 0.0024 | 1.58 |
| 23) | North Dakota | 0.0023 | 1.52 |
| 6) | Ohio | 0.0040 | 2.57 |
| (25) | Oklahoma | 0.0023 | 1.51 |
| (39) | Oregon | 0.0013 | 0.83 |
| 7) | Pennsylvania | 0.0038 | 2.45 |
| 2) | Rhode Island | 0.0058 | 3.71 |
| (14) | South Carolina | 0.0029 | 1.87 |
| 34) | South Dakota | 0.0017 | 1.13 |
| 15) | Tennessee | 0.0028 | 1.80 |
| (38) | Texas | 0.0013 | 0.89 |
| 47) | Utah | 0.0007 | 0.43 |
| 9) | Vermont | 0.0022 | 1.44 |
| 30) | Virginia | 0.0022 | 1.43 |
| (36) | Washington | 0.0015 | 1.01 |
| 28) | West Virginia | 0.0022 | 1.44 |
| 16) | Wisconsin | 0.0027 | 1.78 |
| (41) | Wyoming | 0.0011 | 0.73 |
| | District of Columbia | 0.0281 | 18.014 |
| | TOTAL | .0016 | 1.01 |

| | RANK | ACRE | SQ. MI. |
|---|---|---|---|
| | District of Columbia | 0.0281 | 18.01 |
| (1) | NEW JERSEY | 0.0064 | 4.14 |
| (2) | Rhode Island | 0.0058 | 3.71 |
| (3) | Connecticut | 0.0054 | 3.48 |
| (4) | Massachusetts | 0.0051 | 3.27 |
| (5) | Indiana | 0.0045 | 2.88 |
| (6) | Ohio | 0.0040 | 2.55 |
| (7) | Pennsylvania | 0.0038 | 2.45 |
| (8) | Delaware | 0.0036 | 2.32 |
| (9) | Illinois | 0.0035 | 2.26 |
| (10) | Maryland | 0.0034 | 2.18 |
| (11) | New York | 0.0032 | 2.05 |
| (12) | Iowa | 0.0031 | 1.99 |
| (13) | Michigan | 0.0030 | 1.94 |
| (14) | South Carolina | 0.0029 | 1.87 |
| (15) | Tennessee | 0.0028 | 1.80 |
| (16) | Wisconsin | 0.0027 | 1.78 |
| (17) | Kentucky | 0.0027 | 1.73 |
| (18) | Missouri | 0.0025 | 1.64 |
| (19) | Georgia | 0.0025 | 1.63 |
| (20) | Kansas | 0.0025 | 1.61 |
| (21) | North Carolina | 0.0024 | 1.58 |
| (22) | New Hampshire | 0.0024 | 1.55 |
| (23) | North Dakota | 0.0023 | 1.52 |
| (24) | Arkansas | 0.0023 | 1.51 |
| (25) | Oklahoma | 0.0023 | 1.51 |
| (26) | Minnesota | 0.0023 | 1.49 |
| (27) | Alabama | 0.0023 | 1.48 |
| (28) | West Virginia | 0.0022 | 1.44 |
| (29) | Vermont | 0.0022 | 1.49 |
| (30) | Virginia | 0.0022 | 1.43 |
| (31) | Mississippi | 0.0021 | 1.36 |
| (32) | Nebraska | 0.0020 | 1.33 |
| (33) | Florida | 0.0020 | 1.31 |
| (34) | South Dakota | 0.0017 | 1.13 |
| (35) | Louisiana | 0.0016 | 1.03 |
| (36) | Washington | 0.0015 | 1.01 |
| (37) | California | 0.0015 | 0.98 |
| (38) | Texas | 0.0013 | 0.89 |
| (39) | Oregon | 0.0013 | 0.83 |
| (40) | Colorado | 0.0011 | 0.76 |
| (41) | Wyoming | 0.0011 | 0.73 |
| (42) | Maine | 0.0009 | 0.63 |
| (43) | New Mexico | 0.0008 | 0.54 |
| (44) | Hawaii | 0.0007 | 0.51 |
| (45) | Montana | 0.0007 | 0.51 |
| (46) | Idaho | 0.0007 | 0.50 |
| (47) | Utah | 0.0007 | 0.43 |
| (48) | Nevada | 0.0006 | 0.42 |
| (49) | Arizona | 0.0005 | 0.34 |
| (50) | Alaska | 0.0000 | 0.01 |

OF ROAD; THE HIGHEST MOTOR VEHICLE REGISTRATION PER AREA; AND THE LARGEST ROAD MILEAGE PER AREA. IT IS LOGICAL, THEREFORE, TO EXPECT MANY PROBLEMS TO APPEAR IN NEW JERSEY FIRST.

## 4. PURPOSE

### 4.1 LOOK AHEAD

IT IS MUCH MORE IMPORTANT TO LOOK AT THE FUTURE THAN AT THE PAST. THE POPULATION OF THE UNITED STATES AND THE WORLD INCREASES AT A RATE WHICH DOUBLES EVERY 40 YEARS. LET'S TRY TO LOOK 2000 YEARS INTO THE FUTURE, OF COURSE OBSERVING INTERMEDIATE YEARS AS WE GO.

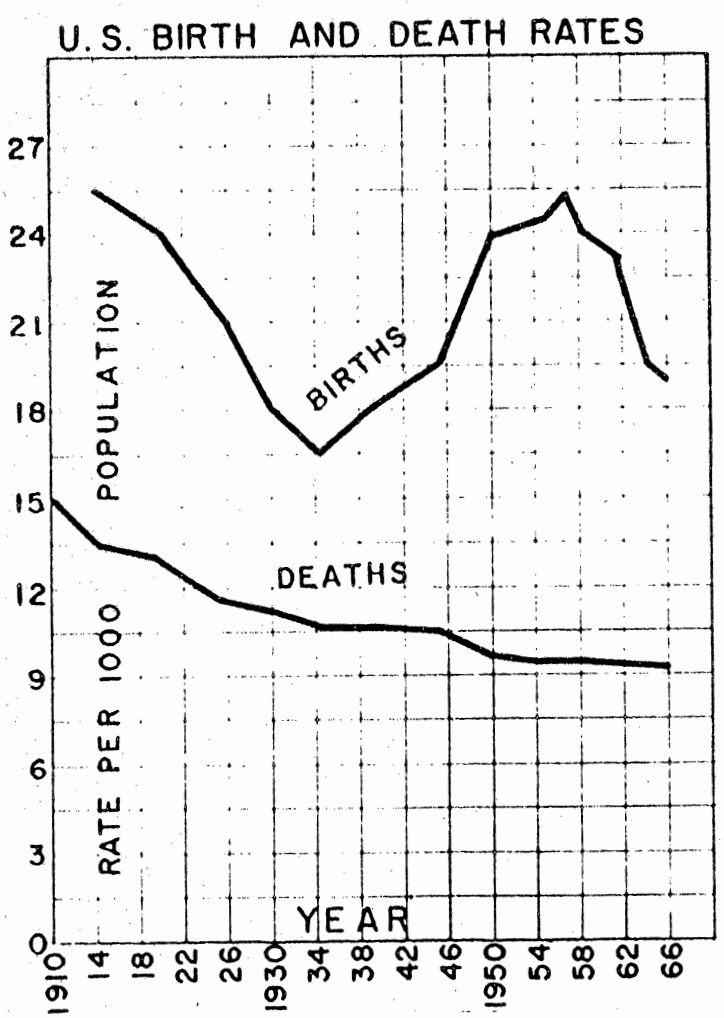
ASSUMING THAT 25 YEARS IS A GENERATION, THERE ARE ONLY 80 GENERATIONS IN A 2000 YEAR PERIOD. MANY INDIVIDUALS LIVE TO BE 80 YEARS OLD. THERE ARE ONLY 25 SUCH PERIODS IN 2000 YEARS.

OUR GRANDCHILDREN WILL BE THE SAME AGE AS WE ARE NOW IN THE YEAR 2025. I AM SURE WE DO NOT WANT TO FEEL THAT THEY ARE GOING TO HAVE A HOPELESS SITUATION AT THAT TIME.

IN THE YEAR 2010 (ABOUT 40 YEARS FROM NOW) THE UNITED STATES WILL HAVE 400 MILLION PEOPLE, WHICH IS EQUAL TO INDIA'S POPULATION TODAY. IN 2050 WE WILL HAVE 800 MILLION PEOPLE, WHICH IS EQUAL TO CHINA'S POPULATION TODAY. AT THAT TIME (80 YEARS FROM NOW) CHINA WILL HAVE 3.2 BILLION PEOPLE WHICH IS EQUAL TO THE WORLD POPULATION TODAY. WE WILL REACH 1 BILLION IN 2070 (100 YEARS FROM NOW). CONTINUING AT THIS SAME RATE, IN THE YEAR 2090 OUR POPULATION WILL BE 1,600,000,000 AND IN 2130 IT WILL BE 3,200,000,000 AND SO ON.

FROM 1950 TO 1960, THE UNITED STATES POPULATION GREW AT A RATE OF 1.75 PERCENT PER YEAR. THIS IS EXACTLY EQUAL TO THE POPULATION GROWTH FOR THE WORLD DURING THAT SAME PERIOD. THE YEARLY RATE FOR EUROPE WAS 1.00 PERCENT; FOR ALL OF NORTH AMERICA 1.75 PERCENT; FOR ALL OF AFRICA AND ASIA 2.00 PERCENT; FOR OCEANIA 2.25 PERCENT; AND FOR LATIN AMERICA 2.50 PERCENT PER YEAR. /1

SOME INDIVIDUALS COMMENTING ON OUR POPULATION GROWTH STATE THAT THE RATE OF INCREASE IS DECLINING BECAUSE OF THE DECLINING BIRTH RATE. THE BIRTH RATE HAS BEEN DECLINING SINCE 1957 BUT IF WE LOOK AT THE RATES SINCE 1915, WE WILL SEE THAT THE BIRTH RATE DECLINES, INCREASES, AND DECLINES AGAIN IN UNIFORM CYCLES. IN 1915 THE BIRTH RATE WAS 25 PER THOUSAND POPULATION. THE RATE DECLINED FOR 20 YEARS. IN 1935, THE RATE WAS 16.9. IT THEN INCREASED FOR 22 YEARS TO 1957 WHEN THE RATE WAS 25.3. IT HAS DECLINED SINCE THEN TO THE RATE OF 19 IN 1966. IF THIS CYCLING THEORY IS CORRECT, THE BIRTH RATE SHOULD BE ON THE RISE AGAIN AFTER 1980. THE DEATH RATE IN 1900 WAS 17.2 PER THOUSAND POPULATION. IT DECLINED AT A YEARLY RATE SLIGHTLY OVER 1 PERCENT TO 1950 WHEN THE RATE WAS 9.6. SINCE THEN, IT HAS REMAINED ALMOST CONSTANT FLUCTUATING BETWEEN 9.2 AND 9.7 EACH YEAR.



## ESTIMATES - WORLD POPULATION

(ADD 000,000)

W. F. WILLCOX 1650 - 1900 | UNITED NATIONS 1920 - 1963

| | WORLD TOTAL | AFRICA | NORTH AMERICA | LATIN AMERICA | ASIA | EUROPE | OCEANIA |
|---|---|---|---|---|---|---|---|
| 1650 | 470 | 100 | 1 | 7 | 257 | 103 | 2 |
| 1750 | 694 | 100 | 1 | 10 | 437 | 144 | 2 |
| 1850 | 1,091 | 100 | 26 | 33 | 656 | 274 | 2 |
| 1900 | 1,571 | 141 | 81 | 63 | 857 | 423 | 6 |
| 1920 | 1,811 | 141 | 117 | 91 | 966 | 487 | 8.8 |
| 1940 | 2,249 | 176 | 146 | 131 | 1,212 | 573 | 11.3 |
| 1950 | 2,510 | 206 | 167 | 162 | 1,386 | 576 | 13 |
| 1960 | 2,995 | 254 | 199 | 206 | 1,679 | 641 | 16.5 |
| 1963 | 3,160 | 294 | 208 | 231 | 1,745.5 | 664.5 | 17 |
| PERCENTAGE INCREASE PER YEAR 1950-1960 | 1.75 | 2.00 | 1.75 | 2.50 | 2.00 | 1.00 | 2.25 |

SOURCE: INFORMATION PLEASE ALMANAC ATLAS 1966

SOME THOUGHTS ARE TO HAVE WARS TO THIN OUT OUR POPULATION. OTHERS FEEL THAT BIRTH CONTROL IS NECESSARY. SOME THOUGHTS SUGGEST STERILIZATION OF THOSE WITH LOW GRADE MENTALITIES. DISEASE COULD THIN OUR POPULATION AS COULD EARTHQUAKES, VOLCANO ERUPTION, ETC. NONE OF THESE SEEM TO PROVE POPULAR. IN FACT, OUR ATTEMPTS ARE TO END WARS FOREVER, ELIMINATE DISEASE GERMS AND DEVELOP SURVIVAL METHODS AGAINST EARTHQUAKE AND MAJOR CALAMITIES.

AT THE CURRENT RATE OF GROWTH, 1000 YEARS FROM NOW THERE WOULD BE 1 PERSON FOR EVERY 2 SQ. IN. OF LAND AREA IN THE UNITED STATES, INCLUDING ALASKA; AND 2000 YEARS FROM NOW THERE WOULD BE 15 MILLION PEOPLE FOR EACH SQ. IN. OF LAND AREA. EVEN THOSE WHO PREVIOUSLY HAVE CONSIDERED THAT THERE IS PLENTY OF ROOM FOR EXPANSION AND GROWTH MUST WINCE AT THESE FIGURES.

NOTING THESE OBSERVATIONS, THERE IS STRONG JUSTIFICATION FOR SPACE TRAVEL EXPENDITURES, SEARCHING FOR FOOD SUPPLIES AND FOR FUTURE WATER SUPPLIES. BUT, GETTING BACK TO TRANSPORTATION, IT ALSO JUSTIFIES THE EXPANSION OF ALL TYPES OF TRANSPORTATION FACILITIES WITHOUT LESSENING OF EFFORT ON ANY.

### 4.2 A NEED FOR IMPROVEMENTS

A REALIZATION OF THE MAGNITUDE OF OUR INCREASING PROBLEMS STIMULATES AN EFFORT TO DEVELOP A SAFE ROAD SYSTEM WHICH HAS A GREATER CAPACITY AND CAN PROVIDE A BETTER LEVEL OF SERVICE FOR BOTH THE IMMEDIATE AND MORE DISTANT FUTURE THAN CAN OUR PRESENT ROAD SYSTEMS.

## 5. A NEW CONCEPT

### 5.1 BASIC PRINCIPLE

THIS DISCUSSION PROPOSES THE CONCEPT OF A FREEWAY SYSTEM WITHOUT BRIDGES, A SYSTEM OF CITY STREETS ON FREEWAY PRINCIPLE WITHOUT BRIDGES OR TRAFFIC SIGNALS, AND TRANSITION ROADS OF SIMILAR DESIGN. THERE WOULD BE BRIDGES ON THIS SYSTEM ONLY AT RAILROAD AND WATERWAY CROSSINGS, IN WHICH CASE THE ROADWAYS WOULD GO OVER THE FACILITY TO ALLOW FOR CONVENIENT FUTURE WIDENING OF THE ROADWAYS. WHERE SPECIAL TREATMENT FOR PEDESTRIAN CROSSINGS WERE NECESSARY, THESE WOULD BE UNDERPASSES SUPPLEMENTED WITH TELEVISION CLOSED CIRCUIT SURVEILLANCE.

THE ACCOMPLISHMENT OF FREEWAY MOVEMENT WITHOUT THE USE OF GRADE SEPARATION BRIDGES IS BY MEANS OF CONVERGING ONE-WAY ROADS AND DIVERGING ONE-WAY ROADWAYS WITH CONVERGING AND DIVERGING POINTS AT LEAST 1-1/2 MILES APART ON THE MAJOR FREEWAYS BUT LESSER DISTANCES APART ON THE OTHERS.

THIS TYPE OF SYSTEM WOULD AVOID THE COMPLEXITIES OF OUR MODERN HIGHWAY INTERSECTION DESIGNS WHICH, IN MANY CASES, REQUIRE VERY EXPENSIVE SIGNING TO GUIDE TRAFFIC THROUGH THE INTERSECTION. THE COST OF SUCH SIGNING MAY EXCEED THE COST OF GRADE SEPARATIONS OF A FEW YEARS BACK AND STILL NOT BE SATISFACTORY.

THE PRIMARY ADVANTAGE OF THIS CONCEPT OVER CURRENT DESIGNS IS THE VERY LARGE REDUCTION IN ACCIDENTS, INJURIES AND FATALITIES THAT WOULD BE REALIZED. A MOTOR VEHICLE ACCIDENT IS THE RESULT OF TWO FACTORS; AN UNINTENDED ERROR OF A DRIVER AND A BAD PHYSICAL SITUATION WHICH COMPOUNDS THIS ERROR INTO DAMAGE OR INJURY. IF THERE WERE MANY BAD PHYSICAL SITUATIONS BUT DRIVERS DID NOT MAKE ERRORS, THERE WOULD BE NO ACCIDENTS. AN ILLUSTRATION IS A ROAD ALONG THE UPPER EDGE OF A CURVING CLIFF. IF THERE WERE NO BAD PHYSICAL SITUATIONS AND DRIVERS MADE MANY ERRORS, THERE WOULD BE NO ACCIDENTS. AN ILLUSTRATION WOULD BE A ONE-WAY ROAD WITHOUT OBSTACLES WITHIN AN AREA EACH SIDE OF THE ROAD THAT AN OUT-OF-CONTROL VEHICLE COULD REACH. IT IS IMPOSSIBLE TO ELIMINATE HUMAN ERRORS. WE MAKE MANY MISTAKES EVEN WHEN WE KNOW BETTER. WE DO MANY THINGS THAT WE LATER WISH WE HAD NOT DONE BUT WE KNOW THAT WE WILL DO THEM AGAIN. IT IS WITHIN OUR POWER TO ELIMINATE BAD PHYSICAL SITUATIONS. WE HAVE REMOVED MANY SO-CALLED HAZARDS ONLY TO UNCOVER OTHER

HAZARDS. IF TREES OR POLES 2 FT. FROM THE EDGE OF THE PAVEMENT ARE REMOVED, THEN THOSE 10 FT. FROM THE EDGE BECOME SERIOUS HAZARDS AND MAY RESULT IN MORE ACCIDENTS THAN PREVIOUSLY. ON A ROAD WHERE TELEGRAPH POLES ARE SPACED ABOUT 200 FT. ALONG A ROAD AND 10 FT. FROM THE EDGE, A VEHICLE RUNNING OFF THE ROAD AT 60 MPH CANNOT POSSIBLY AVOID HITTING AT LEAST 1 POLE. IT HAS BEEN ESTIMATED THAT 60,000 UTILITY POLES ARE KNOCKED DOWN PER YEAR IN THE U. S. MANY OF US KNOW OF A LARGE TREE THAT HAS BEEN THE SCENE OF REPEATED FATALITIES BUT STRONG OBJECTION TO REMOVAL OF THE TREE IS BASED ON A POEM, "ONLY GOD CAN MAKE A TREE".

EVEN THE EXISTENCE OF A BRIDGE IS A HAZARD. CARS MAY HIT A PIER OR ABUTMENT OR DRIVERS MAY INTENTIONALLY OR UNINTENTIONALLY DRIVE OFF OF AN OVERPASS. OCCASIONALLY ROCKS ARE THROWN DOWN FROM BRIDGES ONTO PASSING VEHICLES BY PERSONS WITH CRIMINAL IMPULSES OR BY PRANKSTERS, RESULTING IN SERIOUS INJURY AND FATALITIES. THIS SEEMS TO BE ON THE INCREASE.

THE ABSENCE OF HAZARDOUS PHYSICAL SITUATIONS MAKES IT IMPOSSIBLE TO CAUSE DEATH OR SERIOUS INJURY OF THE "FIXED OBJECT" TYPE WHETHER UNINTENTIONAL OR INTENTIONAL. THE INTENTIONAL TYPE OF ACCIDENT MAY BE CLASSIFIED AS RESULTING FROM A SUICIDAL IMPULSE. THIS IMPULSE IS GENERALLY OF SHORT DURATION AND POSSIBLY WOULD HAVE FADED IF AN INVITING SITUATION HAD NOT BEEN AVAILABLE AT A TIME COINCIDING WITH THE IMPULSE. EVIDENCE HAS BEEN REPORTED INDICATING THAT A SURPRISINGLY HIGH PERCENTAGE OF MOTOR VEHICLE FATALITIES MAY BE THE RESULT OF SUICIDAL IMPULSES.

THE ENTIRE ROAD NETWORK UNDER THIS NEW CONCEPT IS DIVIDED INTO THREE ROADWAY SYSTEMS, NAMELY, UNTIL BETTER NAMES ARE DETERMINED, AN A-WAY SYSTEM, A B-WAY SYSTEM AND A C-WAY SYSTEM. THE A-WAY SYSTEM IS THE PRINCIPAL HIGH SPEED FREEWAY SYSTEM. THE B-WAY SYSTEM SERVES AS A TRANSITION FREEWAY SYSTEM BETWEEN THE A-WAY ROADS AND THE C-WAY ROADS. THE C-WAY SYSTEM CONSISTS OF THE LOCAL ROADWAYS WHICH INCLUDES CITY STREETS, RESIDENTIAL STREETS, INDUSTRIAL ROADS, BUSINESS ROADS, ETC. ALL SYSTEMS CONSIST OF INDEPENDENT ONE-WAY ROADWAYS, THAT IS, THEY SHOULD NOT BE CONSIDERED AS ONE DIRECTION OF A DIVIDED HIGHWAY.

## 5.2 A-WAYS /1

THE A-WAYS ARE FREEWAYS ON 300 FT. WIDE RIGHT-OF-WAYS. THIS PROVIDES FOR 8 LANES ON A 100 FT. WIDE PAVEMENT ALL IN ONE DIRECTION FLANKED ON EACH SIDE BY A GRADED AREA 100 FT. WIDE, LANDSCAPED WITH SCREENING BETWEEN THE ROADWAY AND ADJACENT PROPERTIES. THE CENTER LINE OF THESE ROADWAYS WOULD HAVE A MINIMUM RADIUS OF 8,000 FT. WHICH WOULD PERMIT SPEEDS WELL ABOVE THOSE SPEEDS EXISTING AT THE PRESENT TIME OR EVEN CONSIDERED FOR THE FUTURE. THE DISTANCE BETWEEN MERGING POINTS AND DIVERGING POINTS WOULD BE A MINIMUM OF 8,000 FT. AND, THEREFORE, COULD NOT BE CLASSED AS A WEAVING AREA. CAPACITY WOULD BE LIMITED ONLY BY THE CAPACITY OF A LANE AND THE NUMBER OF LANES USED. THERE SHOULD BE NOTHING WITHIN 100 FT. OF THE EDGE OF THE ROADWAY WHICH WOULD CAUSE AN IMPACT TO A CAR THAT RAN OFF THE ROAD. WITHIN THIS AREA THERE SHOULD BE NO TELEGRAPH POLES, NO TREES OVER A 3 IN. DIAMETER, NO VERTICAL CURBS AND, WHERE THE ROADWAYS WENT OVER STREAMS, RIVERS AND RAILROADS, RAILING SHOULD HAVE A SPECIAL TREATMENT SO AS TO REDUCE THE IMPACT TO A MINIMUM WHEN CARS RUN OFF THE ROAD. THE OVERPASS COULD BE 300 FT. WIDE. THE ONLY SIGNING NECESSARY WOULD BE THAT FOR ROUTE NUMBERING. THE SIGNPOSTS SHOULD BE WELL BACK AWAY FROM THE ROAD AND LETTERING SHOULD BE SUCH AS TO BE LEGIBLE FOR A LONG DISTANCE FOR APPROACHING TRAFFIC. HOLOGRAPH SIGNS MAY BE DEVELOPED OR SIGNS AND POSTS OF FLEXIBLE MATERIAL SO THAT IT WILL BE UNNECESSARY TO HAVE SIGNPOSTS OR STRUCTURES CREATING IMPACT HAZARDS.

/1 Page 26

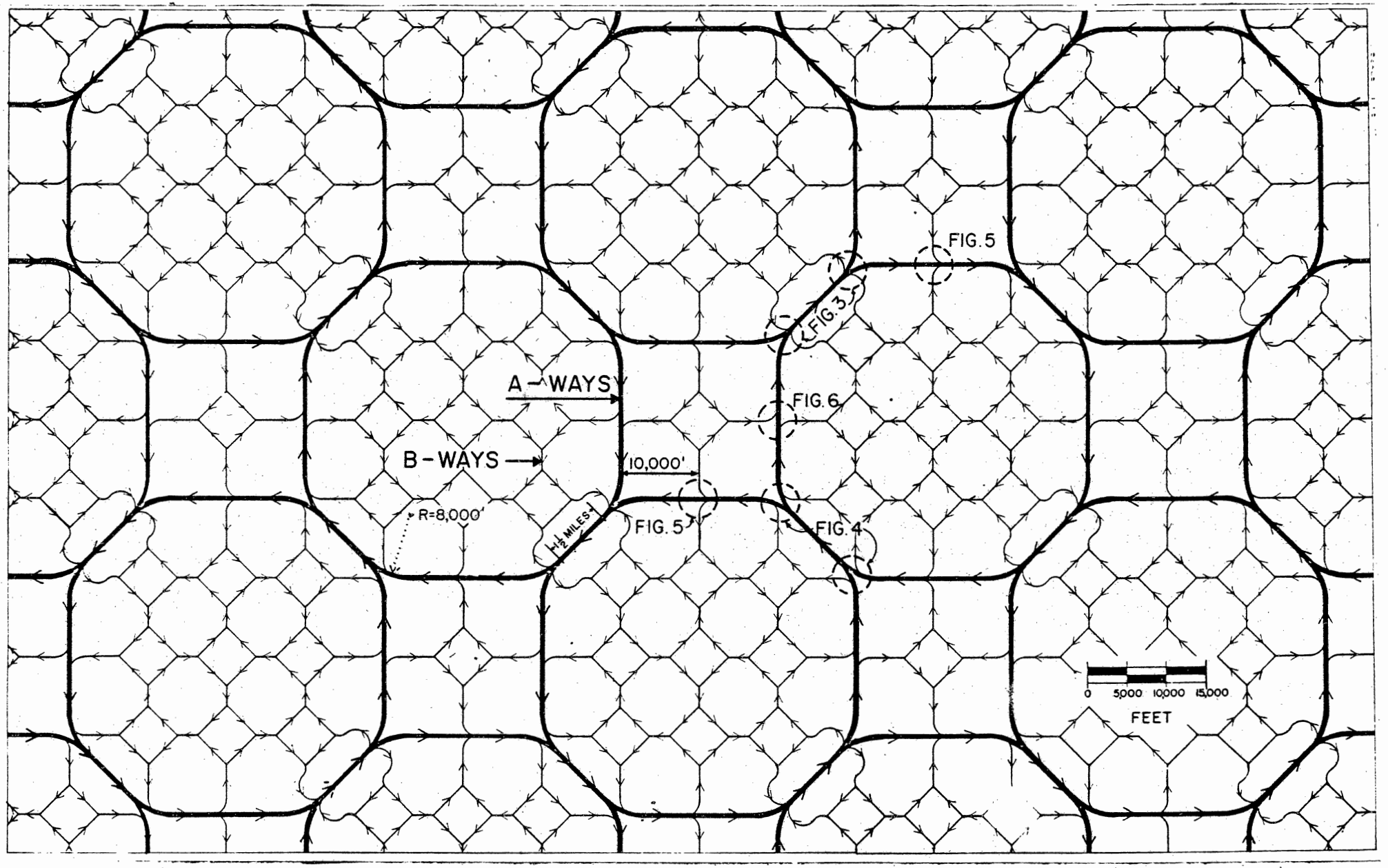


FIG. 5
FIG. 3
A-WAYS
FIG. 6
B-WAYS
10,000'
R=8,000'
1½ MILES
FIG. 5
FIG. 4
0 5,000 10,000 15,000
FEET

## 5.3 B-WAYS /1

THE B-WAYS ARE FREEWAYS SIMILAR TO THE A-WAYS EXCEPT THAT THEIR MINIMUM RADIUS IS 1,760 FT. AND THE DISTANCE BETWEEN MERGING POINTS AND DIVERGING POINTS IS 1,760 FT. NOTE THAT THE B-WAYS PROVIDE FOR MOVEMENTS IN DIRECTIONS THAT ARE 45° OFF OF THE A-WAY DIRECTIONS. THE 1,760 FT. MINIMUM RADIUS PROVIDES FOR 70 MPH SPEEDS. THE B-WAYS SERVE AS TRANSITIONS BETWEEN THE A-WAYS AND THE LOCAL STREETS.

## 5.4 C-WAYS /2

THE LOCAL STREETS ARE CALLED, FOR THIS DISCUSSION, C-WAYS. THESE ARE ONE-WAY STREETS OF A 40 FT. WIDE PAVEMENT. THERE IS NO CROSS TRAFFIC AND, THEREFORE, NO TRAFFIC SIGNALS. IF AND WHERE PEDESTRIAN AND VEHICULAR TRAFFIC VOLUMES WERE SUFFICIENT TO CAUSE UNDESIRABLE INTERFERENCES, PEDESTRIAN UNDERPASSES WOULD BE PROVIDED. THERE WOULD BE NO ON-STREET PARKING THEREBY PROVIDING A CONTINUOUS FLOW OF TRAFFIC. PART OF THIS AREA COULD BE DEVOTED TO A SHOPPING CENTER AREA. INDUSTRY SHOULD BE LOCATED IN AREAS ISOLATED FROM THE RESIDENTIAL AREAS. THE B-WAYS SURROUND AREAS WHICH ARE SMALL AND, THEREFORE, WILL NOT GENERATE TRAFFIC IN EXCESS OF THAT WHICH MAY BE WELL SERVED BY THE LOCAL STREET SYSTEM.

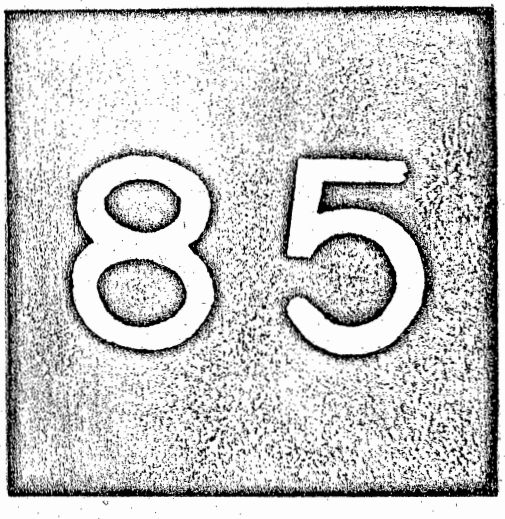
CONCENTRATIONS OF TRAFFIC BETWEEN LARGE AREAS WOULD BE SERVED BY THE B-WAY SYSTEM AND, BETWEEN STILL LARGER AREAS, BY THE A-WAY SYSTEM. THIS OVERALL SYSTEM PROVIDES A MEANS OF INCREASING CAPACITY TO MATCH THE INCREASE OF TRAFFIC VOLUMES WITHOUT DESTROYING PREVIOUS IMPROVEMENTS. THE CAPACITY OF SUCH A SYSTEM AS THE A-WAYS AND B-WAYS, EXPANDABLE TO 24 LANES IN ONE DIRECTION, HAS NOT YET BEEN DETERMINED BUT IT IS RECOGNIZED AS BEING FAR IN EXCESS OF THE CAPACITY OF EXISTING SYSTEMS AT THE PRESENT TIME. A SYSTEM SUCH AS THIS WOULD REQUIRE A MAJOR ADJUSTMENT OF OUR EXISTING ROAD SYSTEM BUT THIS IS INEVITABLE IN ANY CASE AND, THEREFORE, WE SHOULD BE PREPARED TO GET THE MOST OUT OF SUCH AN ADJUSTMENT.

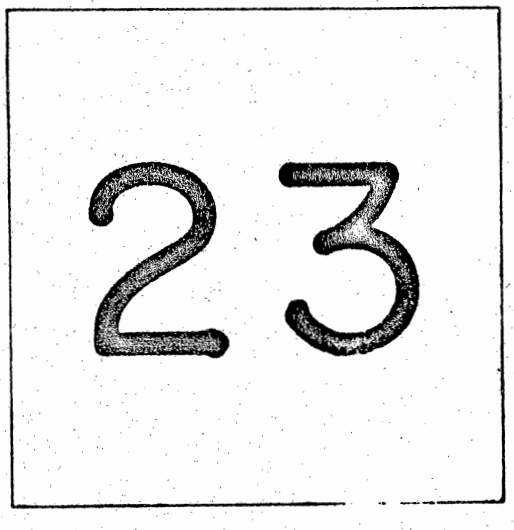
/1 Pages 26,28
/2 Page 28

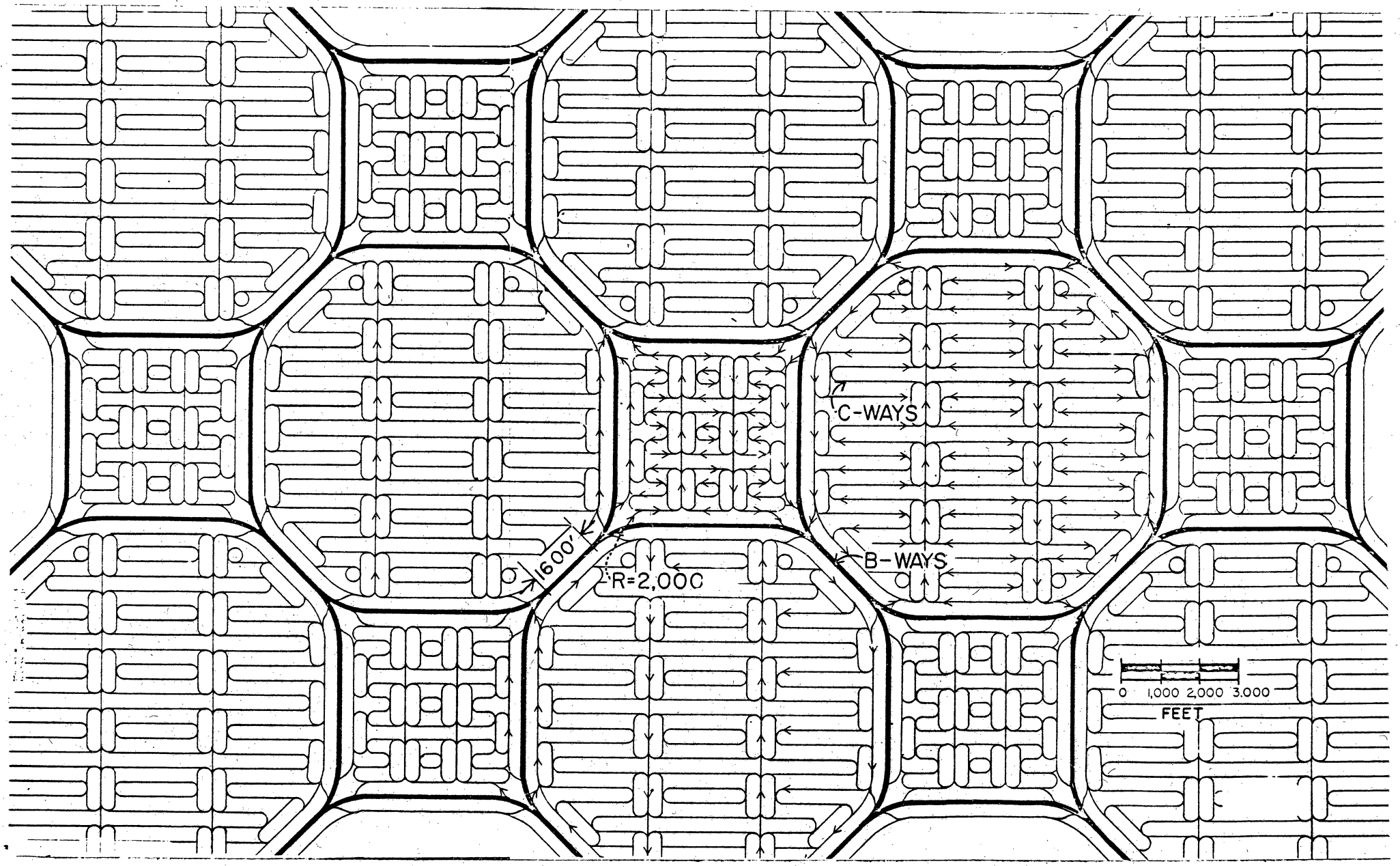
THE VOLUME OF TRAFFIC ON THE C-WAY STREETS WOULD BE SMALL BECAUSE THEY WOULD SERVE A VERY SMALL DRAINAGE AREA. THE VOLUMES CAN BE ESTIMATED BY SUCH MEANS AS USING VALUES OF 7 VEHICLES PER AVERAGE DAY GENERATED PER DWELLING. THIS VALUE VARIES DEPENDING ON THE TYPE OF DEVELOPMENT. THE PATTERN FOR THE STREET LAYOUT SHOULD BE SUCH THAT VOLUMES DO NOT ACCUMULATE ON ANY ONE STREET.

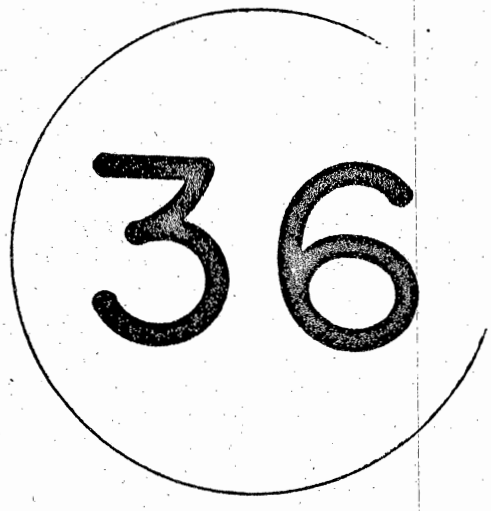
## 5.5 ROUTE AND STREET NUMBERING

A NUMBERING CODE FOR THE DESIGNATION OF FREEWAYS AND THE STREETS CAN BE DEVISED WHICH PINPOINTS ALL AREA LOCATIONS. IT IS UNNECESSARY TO GIVE MUNICIPALITY NAMES. THIS WILL ELIMINATE THE NEED FOR DIRECTION SIGNS OF EACH MUNICIPALITY. THE NUMBERING SYSTEM WILL DICTATE PRECISELY THE LOCATION OF A DESTINATION ANYWHERE WITHIN THE STATE



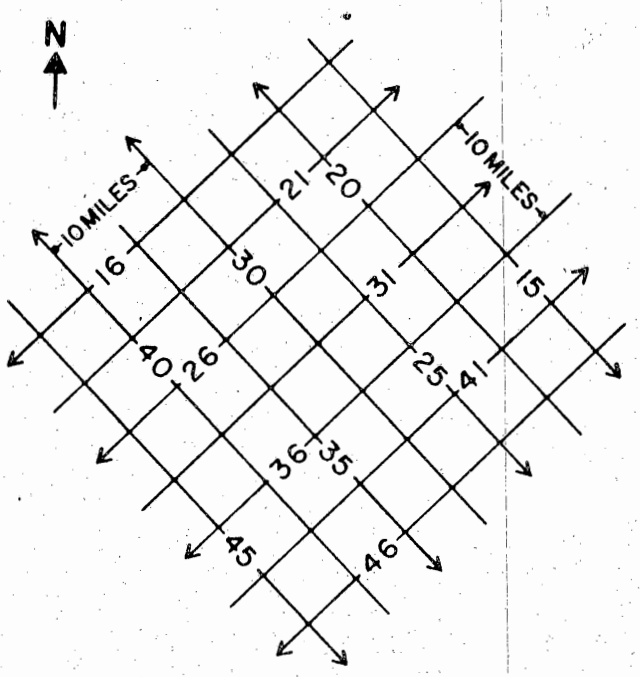




C-WAYS
B-WAYS
1600'
R=2,000
0 1,000 2,000 3,000
FEET





## A-WAYS




THE A-WAYS RUN NORTHEASTERLY, SOUTHWESTERLY, SOUTHEASTERLY, AND NORTHWESTERLY. THE ROUTES FOR TRAFFIC GOING IN A NORTHWESTERLY DIRECTION ARE 20, 30, 40 AND SO ON, POSSIBLY TO 230. THE ROUTES IN A SOUTHEASTERLY DIRECTION ARE 15, 25, 35 AND SO ON, UP POSSIBLY TO 235. FOR TRAFFIC IN A SOUTHWESTERLY DIRECTION THE ROUTES ARE NUMBERED 16, 26, AND POSSIBLY UP TO 236. FOR TRAFFIC GOING IN A NORTHEASTERLY DIRECTION, THE ROUTES ARE NUMBERED 21, 31, 41 AND SO FORTH, POSSIBLY UP TO 231. FROM THIS SYSTEM THEN, IT IS EASY TO DETERMINE THE TRAVEL DIRECTION OF ANY OF THE ROUTES. IT IS ALSO EASY TO DETERMINE THE DISTANCE BETWEEN PARALLEL ROUTES (PARALLEL USED HERE MEANS CONCENTRIC). ROUTE 180 WOULD BE 110 MILES FROM ROUTE 70 SINCE THESE DEFINITIONS CORRESPOND TO MILEPOST NUMBERS ON THE ROUTES BEING CROSSED. THE NUMBERS INCREASE FROM THE NORTHWEST SECTION OF THE STATE AS YOU PROCEED TO THE SOUTHEAST SECTION AND ALSO INCREASE FROM THE NORTHEAST SECTION TOWARDS THE SOUTHWEST SECTION.

THE PARALLEL ROUTES GOING IN THE SAME DIRECTION ARE 10 MILES APART. AN AREA SURROUNDED BY A-WAYS IS DESIGNATED AS A "REGION"; AND AN AREA SURROUNDED BY B-WAYS, OR PARTLY BY A-WAYS AND PARTLY BY B-WAYS, IS CALLED A "SECTION"; AND AN AREA SURROUNDED BY C-WAYS, OR PARTLY BY C-WAYS AND B-WAYS, OR PARTLY BY C-WAYS AND A-WAYS, IS CALLED A "BLOCK". A REGION IS DESIGNATED BY THE NUMBERS OF THE ROUTES SURROUNDING IT. THE NUMBER OF THE NORTHWEST BOUND ROUTE APPEARS FIRST, THEN THE NUMBER OF THE SOUTHEAST BOUND ROUTE, THEN THE NUMBER OF THE NORTHEAST BOUND ROUTE, AND LASTLY THE NUMBER OF THE SOUTHWEST BOUND ROUTE. A SPACE SHOULD APPEAR BETWEEN THE NON-PARALLEL ROUTE NUMBERS. THESE ARE SIMPLIFIED FOR SIGNING BY OMITTING UNNECESSARY DIGITS. FOR EXAMPLE: REGION 21-143 INDICATES THAT THE REGION LIES BETWEEN ROUTE 20, ROUTE 15, ROUTE 141, AND ROUTE 136. IN THIS MANNER, A DRIVER CAN TELL HOW FAR HE MUST GO BEFORE HE REACHES THIS AREA AND WHETHER IT WILL BE TO HIS LEFT OR HIS RIGHT.

THE B-WAYS RUN NORTH AND SOUTH, AND EAST AND WEST. NUMBERS 1, 3, 5 AND 7 ARE EASTBOUND ROADS. NUMBERS 2, 4 AND 6 ARE WESTBOUND ROADS. NUMBERS 8, 10, 12 AND 14 ARE SOUTHBOUND ROADS. NUMBERS 9, 11 AND 13 ARE NORTHBOUND ROADS. ADJACENT PARALLEL ROADS GOING IN THE SAME DIRECTION ARE TWO MILES APART. THIS PROVIDES FOR THE MILEAGE ALONG ANY ONE ROUTE TO CORRESPOND WITH THE ROUTE NUMBER OF THE ROAD BEING CROSSED. AN AREA SURROUNDED BY THE B-WAYS IS A SECTION AND IS DESIGNATED BY THE NUMBERS OF THE ROUTES SURROUNDING IT. THE EASTBOUND ROUTE IS GIVEN FIRST, THEN THE WESTBOUND ROUTE, THEN THE NORTHBOUND ROUTE, AND LAST, THE SOUTHBOUND ROUTE. FOR EXAMPLE, 34-1112 INDICATES THAT THE SECTION IS BETWEEN ROUTE 3, ROUTE 4, ROUTE 12 AND ROUTE 11. IT ALSO INDICATES THAT IT IS SOUTH OF ROUTE 3 AND NORTH OF ROUTE 4, WEST OF ROUTE 12 AND EAST OF ROUTE 11, SINCE THE EASTBOUND AND WESTBOUND ROUTES INCREASE FROM NORTH TO SOUTH, AND THE NORTHBOUND AND SOUTHBOUND ROUTES INCREASE FROM THE WEST TO THE EAST. /1

THE C-WAYS WILL HAVE NUMBERS 300 AND ABOVE. AN ADDRESS CAN BE GIVEN AS 42 314TH STREET, SECTION 34-1112, REGION 21-143, AND WILL PINPOINT IT GEOGRAPHICALLY WITHIN THE STATE, SO THAT INDIVIDUALS CAN ORIENT IT IN RELATION TO WHEREEVER THEY HAPPEN TO BE. THE ROUTE SIGNS WILL BE DESIGNATED IN SYMBOL FASHION. ODD NUMBERS WILL TELL THE DIRECTION OF MOVEMENT. THE EVEN NUMBERS WILL TELL THE DIRECTION OF MOVEMENT. CERTAIN SIGNS WILL BE CIRCULAR; CERTAIN ONES WILL BE RECTANGULAR. CERTAIN SIGNS WILL BE WHITE ON BLACK; CERTAIN ONES WILL BE BLACK ON WHITE. A COMBINATION OF THIS CODING CAN AID IN FOLLOWING INDIVIDUAL ROUTES. /2

## 5.6 MASS TRANSIT

MASS TRANSIT, ALTHOUGH ITS USE HAS BEEN ON THE DECLINE, IS CONSIDERED ESSENTIAL FOR THE FUTURE. AS POPULATION INCREASES THERE IS AN INCREASE IN THE NUMBER OF THOSE INDIVIDUALS WHO ARE PHYSICALLY UNQUALIFIED TO DRIVE. THIS ELEMENT OF OUR SOCIETY IS GROWING FAST BY VIRTUE OF OUR ABILITY TO LENGTHEN OUR LIFE SPAN. ADDED TO THIS ARE THOSE, WHO BECAUSE OF THE INCREASED TRAFFIC VOLUMES AND ACCOMPANYING PROBLEMS, WILL CHOOSE TO USE MASS TRANSIT FOR A GOOD PERCENTAGE OF THEIR TRIPS.

EXPRESS SUBWAY SYSTEMS WOULD BE LOCATED IN THE A-WAY RIGHT OF WAY WITH LOCAL SUBWAYS UTILIZING THE B-WAYS. C-WAYS WOULD BE SERVED BY BUSES. NO PARKING WOULD BE PERMITTED WITHIN THE ROADWAY OF ANY OF THESE SYSTEMS. A JETPORT COULD BE LOCATED IN SUCH A WAY THAT IT WOULD BE ENTIRELY SURROUNDED BY A-WAYS.

## 5.7 AIR POLLUTION

ELECTRIC VEHICLES MAY BE DEVELOPED OBTAINING THEIR ELECTRIC POWER FROM CABLES WITHIN THE PAVEMENT. THIS WOULD HELP SOLVE THE AIR POLLUTION PROBLEM. IT IS ALSO POSSIBLE TO HEAT THE PAVEMENTS

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/2 Pages 27,29

TO PREVENT THE FORMATION OF SNOW AND ICE. ALL PEDESTRIAN CROSSINGS WOULD BE BY WAY OF UNDERPASSES WITH NO SIDEWALKS ADJACENT TO THE ROADWAYS.

### 5.8 50-YEAR PLAN

FOR NEW JERSEY, IT IS PROPOSED THAT THIS SYSTEM BE PROVIDED, OVER A 50-YEAR PERIOD FROM THE YEAR 1975 TO THE YEAR 2025, AT A COST OF 700 MILLION DOLLARS PER YEAR, NOT INCLUDING RAIL TRANSPORTATION, ELECTRIC CAR PROVISIONS AND HEATED PAVEMENTS.

## 6. FACTS

### 6.1 POPULATION /1

NEW JERSEY'S POPULATION HAS GROWN CONTINUOUSLY. WITH THE EXCEPTION OF THE DEPRESSION YEARS, EACH TEN-YEAR INCREASE HAS VARIED FROM 22 TO 41.1 PERCENT.

10-YEAR POPULATION INCREASES

| | | |
|---|---|---|
| 1840 - 1850 | 31.3% | |
| 1850 - 1860 | 37.2% | |
| 1860 - 1870 | 35.0% | |
| 1870 - 1880 | 24.7% | |
| 1880 - 1890 | 27.7% | |
| 1890 - 1900 | 26.9% | |
| 1900 - 1910 | 41.1% | |
| 1910 - 1920 | 22.0% | |
| 1920 - 1930 | 28.1% | |
| 1930 - 1950 | 2.9% | (30-40) |
| (DEPRESSION YEARS) | 16.2% | (40-50) |
| 1950 - 1960 | 25.5% | |

SINCE 1960 OUR POPULATION HAS CONTINUED TO INCREASE. THE INCREASE FROM 1960 TO 1970 CAN BE ESTIMATED AT 28 PERCENT, WHICH INDICATES THAT IN 1970 THE POPULATION WILL BE 7,700,000. THIS EQUALS THE POPULATION OF THE ENTIRE UNITED STATES IN 1850.

/1 Page 4

DURING EACH 30-YEAR PERIOD FROM 1860 TO 1930, OUR POPULATION MORE THAN DOUBLED.

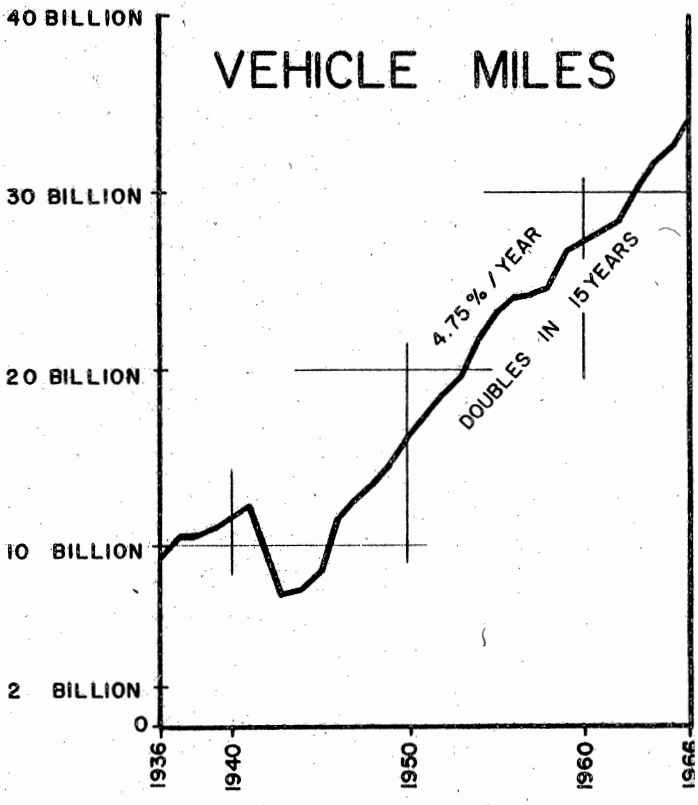
30-YEAR POPULATION INCREASE

| | | |
|---|---|---|
| 1860 x 2.15 | = | 1890 |
| 1870 x 2.02 | = | 1900 |
| 1880 x 2.29 | = | 1910 |
| 1890 x 2.18 | = | 1920 |
| 1900 x 2.20 | = | 1930 |

THE INCREASE FROM 1950 TO 1960 WAS ALSO AT A RATE WHICH DOUBLES IN 30 YEARS AND THIS IS APPARENTLY CONTINUING. IT IS ASSUMED, THEREFORE, THAT NEW JERSEY'S VITALITY CAN SUPPORT A POPULATION INCREASE WHICH WILL CONTINUE TO DOUBLE EVERY 30 YEARS, OR AT A RATE OF 2.25% PER YEAR.

### 6.2 VEHICLE MILES

THE TOTAL VEHICLE MILES TRAVELED IN NEW JERSEY FOR EACH YEAR FROM 1936 TO 1966 HAS GROWN STEADILY. IT CAN BE READILY SEEN THAT TRAFFIC DOUBLES EVERY 15 YEARS WHICH IS A YEARLY RATE OF 4.75 PERCENT INCREASE.



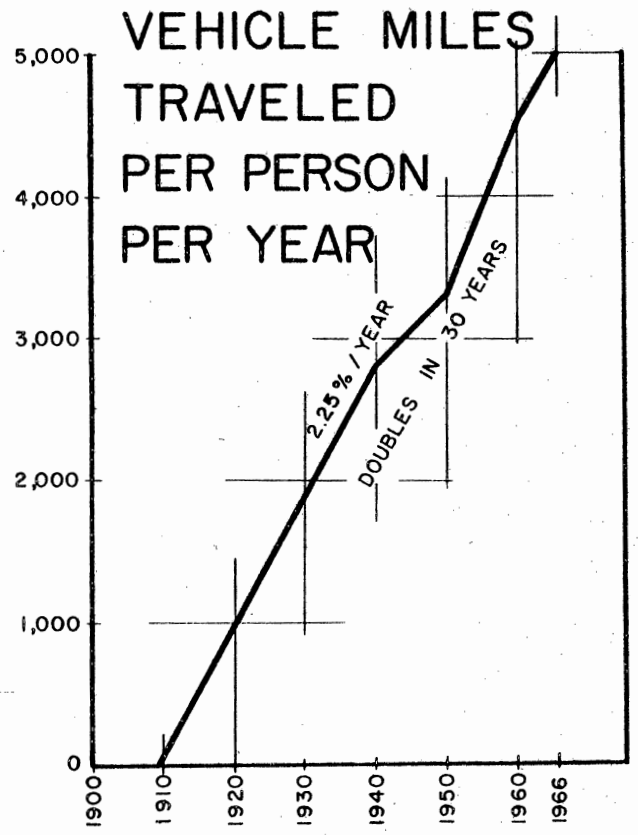
THE FOLLOWING TABLE SHOWS THAT TRAFFIC VOLUMES DOUBLE EVERY 15 YEARS:

15-YEAR TRAFFIC INCREASE

| | | |
|---|---|---|
| 1939 x 1.96 | = | 1954 |
| 1940 x 1.99 | = | 1955 |
| 1941 x 1.95 | = | 1956 |
| 1942 x 2.52 | = | 1957 |
| 1943 x 3.46 | = | 1958 |
| 1944 x 3.51 | = | 1959 |
| 1945 x 3.19 | = | 1960 |
| 1946 x 2.39 | = | 1961 |
| 1947 x 2.23 | = | 1962 |
| 1948 x 2.23 | = | 1963 |
| 1949 x 2.17 | = | 1964 |
| 1950 x 2.06 | = | 1965 |
| 1951 x 1.91 | = | 1966 |

THE PERIODS 1942 TO 1957 UP TO 1945 TO 1960 SHOW ABNORMAL INCREASE BECAUSE OF THE WAR.

AS TIME GOES ON, THE AVERAGE INDIVIDUAL TRAVELS FARTHER AND FARTHER. TO ILLUSTRATE THIS, THE TOTAL CAR MILES IS DIVIDED BY THE TOTAL POPULATION.



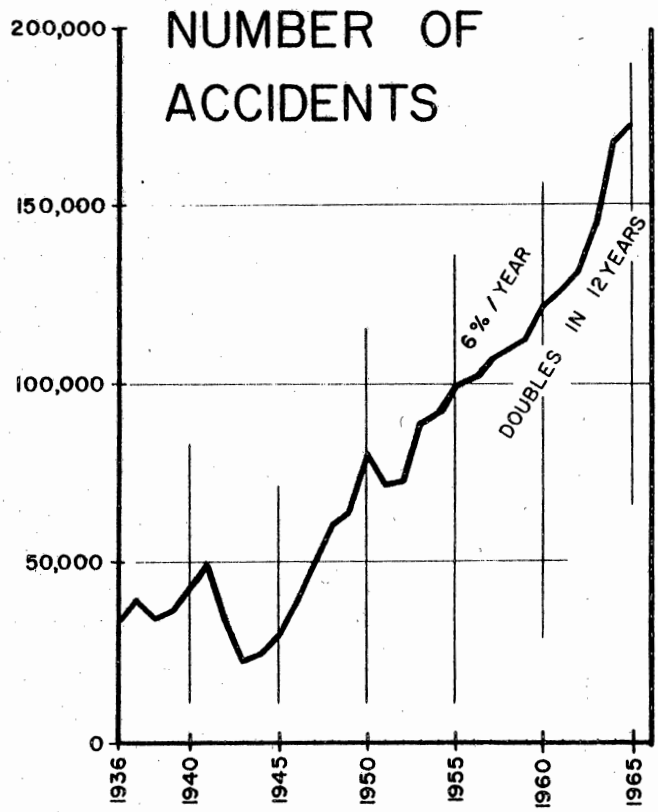

VEHICLE MILES PER PERSON PER YEAR

1920 - 950
1930 - 1738
1940 - 2800
1950 - 3300
1960 - 4500

THE INCREASE FROM 1940 TO 1950 WAS 18 PERCENT OR AN INCREASE OF 1.75 PERCENT PER YEAR. FROM 1950 TO 1960, THE INCREASE WAS 36 PERCENT OR AN INCREASE OF 3 PERCENT PER YEAR. FOR 1966 THE VEHICLE MILES PER PERSON PER YEAR WAS 5,000.

## 6.3 ACCIDENTS

THE TOTAL NUMBER OF ACCIDENTS OCCURRING IN THIS STATE IS DOUBLING EVERY 12 YEARS OR INCREASING AT THE RATE OF 6 PERCENT PER YEAR.



THE FOLLOWING TABLE SHOWS THAT THE NUMBER OF ACCIDENTS IS DOUBLING EVERY 12 YEARS:

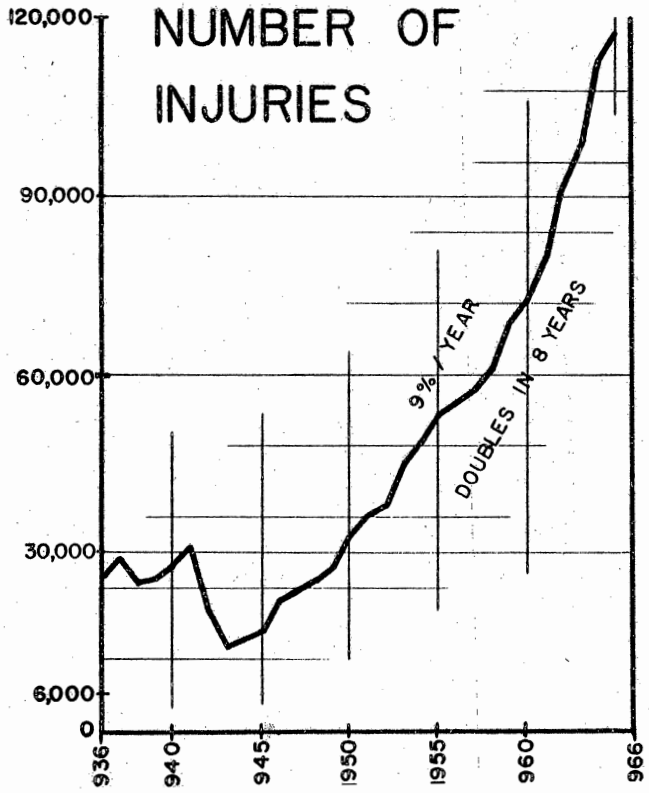
12-YEAR ACCIDENT INCREASE

| | | |
|---|---|---|
| 1936 x 1.75 | = | 1948 |
| 1937 x 1.64 | = | 1949 |
| 1938 x 2.38 | = | 1950 |
| 1939 x 2.00 | = | 1951 |
| 1940 x 1.72 | = | 1952 |
| 1941 x 1.81 | = | 1953 |
| 1942 x 2.73 | = | 1954 |
| 1943 x 4.48 | = | 1955 |
| 1944 x 4.26 | = | 1956 |
| 1945 x 3.78 | = | 1957 |
| 1946 x 2.87 | = | 1958 |
| 1947 x 2.28 | = | 1959 |
| 1948 x 2.03 | = | 1960 |
| 1949 x 1.98 | = | 1961 |
| 1950 x 1.64 | = | 1962 |
| 1951 x 2.00 | = | 1963 |
| 1952 x 2.30 | = | 1964 |
| 1953 x 1.95 | = | 1965 |
| 1954 x 2.00 | = | 1966 |

THE PERIODS 1942 TO 1954 UP TO 1946 TO 1958 REFLECT THE WAR YEARS.

## 6.4 INJURIES

THE NUMBER OF INJURIES DOUBLES EVERY 8 YEARS.



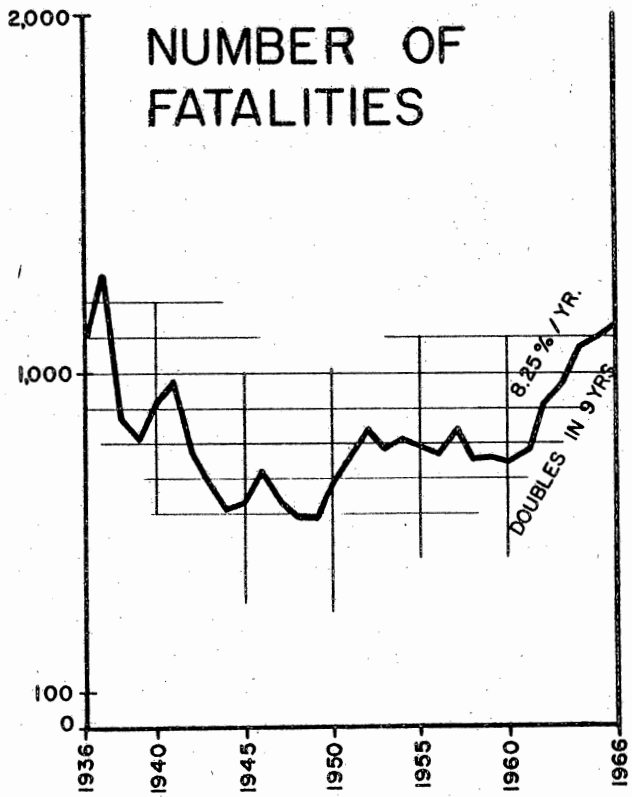

8-YEAR INJURY INCREASE

| | | |
|---|---|---|
| 1943 x 2.59 | = | 1951 |
| 1944 x 2.50 | = | 1952 |
| 1945 x 2.66 | = | 1953 |
| 1946 x 2.23 | = | 1954 |
| 1947 x 2.22 | = | 1955 |
| 1948 x 2.17 | = | 1956 |
| 1949 x 2.10 | = | 1957 |
| 1950 x 1.83 | = | 1958 |
| 1951 x 1.88 | = | 1959 |
| 1952 x 1.90 | = | 1960 |
| 1953 x 1.78 | = | 1961 |
| 1954 x 1.87 | = | 1962 |
| 1955 x 1.87 | = | 1963 |
| 1956 x 2.03 | = | 1964 |
| 1957 x 2.03 | = | 1965 |
| 1958 x 2.01 | = | 1966 |

DOUBLING EVERY 8 YEARS IS AT A YEARLY INCREASE OF 9 PERCENT PER YEAR.

## 6.5 FATALITIES

SINCE 1960 THE NUMBER OF FATALITIES HAS BEEN CONSTANTLY INCREASING AT A RATE OF 8.25 PERCENT PER YEAR WHICH IS EQUIVALENT TO DOUBLING EVERY 9 YEARS.

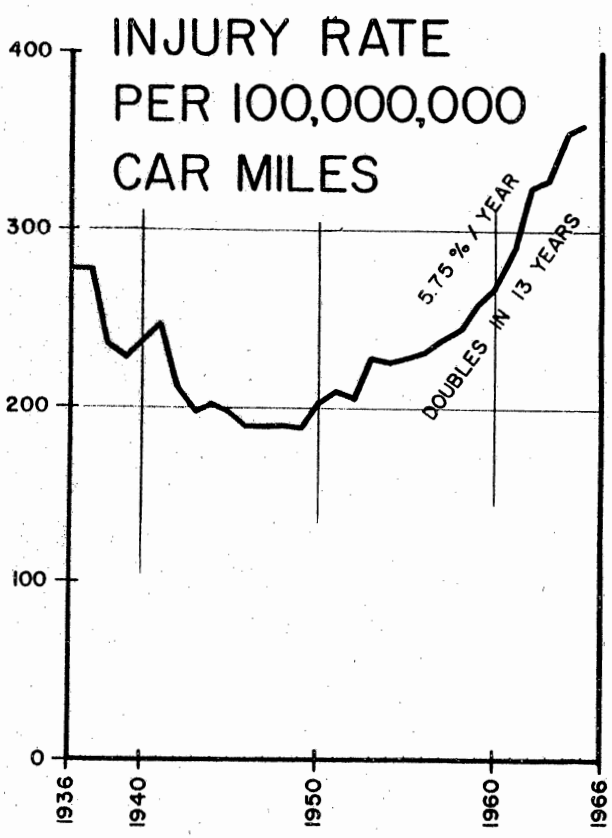


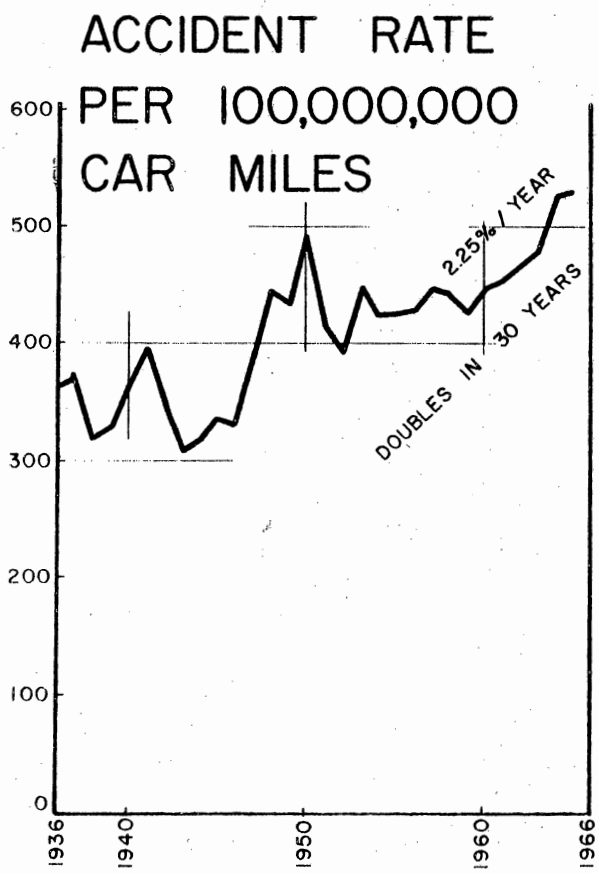
PER TEN THOUSAND PEOPLE

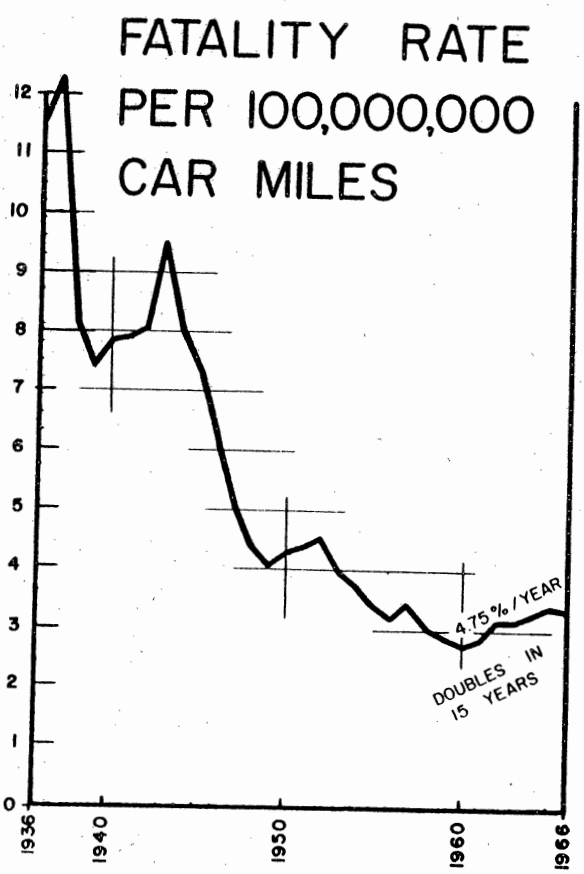
| YEAR | ACCIDENTS | INJURIES | FATALITIES |
|---|---|---|---|
| 1940 | 102.2 | 66.6 | 2.2 |
| 1950 | 165.4 | 68.4 | 1.4 |
| 1960 | 200.7 | 119.9 | 1.2 |
| 1965 | 256.8 | 175.4 | 1.6 |

## 6.6 RATES (ACCIDENTS, INJURIES AND FATALITIES)

THE ACCIDENT RATE PER 100 MILLION VEHICLE MILES, THE INJURY RATE PER 100 MILLION VEHICLE MILES AND THE FATALITY RATE PER 100 MILLION VEHICLE MILES ARE EACH INCREASING.

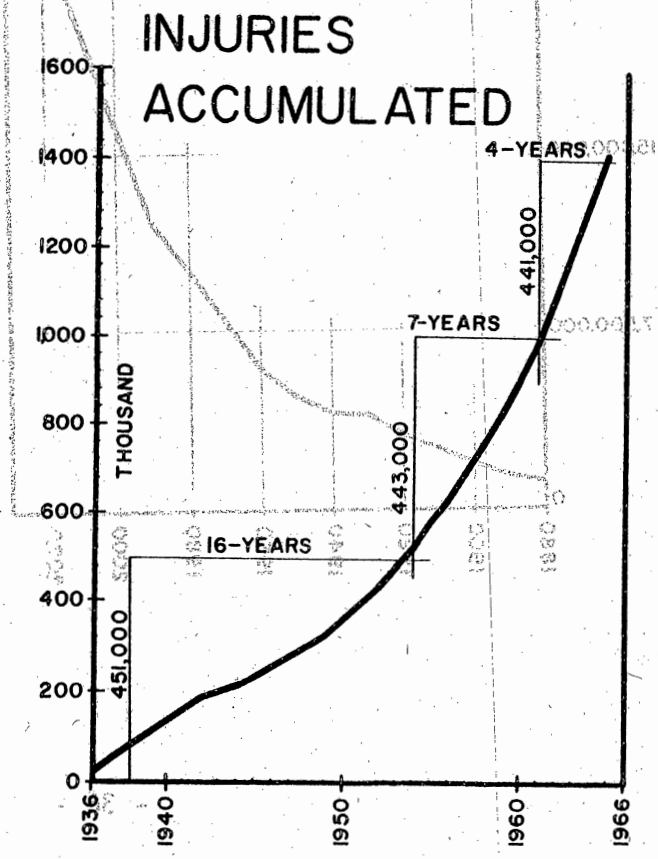


## 6.7 LOSING BATTLE

IT IS INTERESTING TO NOTE THE ACCELERATED PACE MAINTAINED FOR THE NUMBER OF INJURIES. FROM 1938 TO 1954, THERE WAS AN ACCUMULATION OF 451,000 INJURIES IN THE 16-YEAR PERIOD. FROM THE PERIOD 1954 TO 1961, THERE WAS ABOUT THE SAME, 443,000 INJURIES ACCUMULATED IN SEVEN YEARS AND IN THE PERIOD FROM 1961 TO 1965 THERE WAS AGAIN THE SAME NUMBER, 441,000 INJURIES ACCUMULATED IN FOUR YEARS. IN OTHER WORDS, AS MANY PEOPLE ARE INJURED IN FOUR YEARS NOW AS WERE INJURED IN THE PREVIOUS SEVEN YEARS AND ALSO IN THE 16 YEARS PRIOR TO THAT. THESE TRENDS ILLUSTRATED HAVE OCCURRED WHILE STRONG EFFORTS HAVE BEEN MADE IN ORDER TO REDUCE ACCIDENTS, INJURIES AND FATALITIES, BUT APPARENTLY WITHOUT SATISFACTORY RESULTS. THERE HAVE BEEN SUCH EFFORTS AS AUTOMOBILE INSPECTIONS, POINT SYSTEMS, CHANGES IN REPORTING ACCIDENTS, SPEEDING REVOCATIONS, MORE DRIVER EDUCATION, SEAT BELTS, BETTER HIGHWAYS, MORE ENFORCEMENT AND MUCH PUBLICITY. CURRENT IMPROVEMENTS, SUCH AS ALTERATIONS IN THE VEHICLE, ALTHOUGH VERY GOOD ARE NO BETTER THAN MANY OF THE EFFORTS OF THE PAST. THE PROBLEM IS GROWING MUCH FASTER THAN THE SOLUTIONS CURRENTLY CONSIDERED.




EVEN THE PROVISION OF FREEWAYS AS HAVE BEEN DESIGNED DO NOT RESULT IN AN OVERALL REDUCTION IN THE NUMBER OF ACCIDENTS, INJURIES AND FATALITIES.

THIS IS ALSO DISCUSSED IN "OPERATIONAL EFFECTS OF OVERALL GEOMETRICS" IN HIGHWAY RESEARCH BOARD RECORD NUMBER 162.

## 6.8 NATIONWIDE APPLICATION

THE TRENDS CITED ARE NOT PECULIAR TO NEW JERSEY; THEY APPLY RELATIVELY TO ALL STATES.

# 7. ANALYSIS OF FACTS

## 7.1 THE FUTURE

THE PROBLEM CREATED BY THE USE OF THE AUTOMOBILE HAS BECOME VERY SERIOUS BUT THE PROBLEM EXISTING TODAY WILL BE CONSIDERED INSIGNIFICANT IN THE NEAR FUTURE UNLESS A MAJOR BREAKTHROUGH IS MADE TO CORRECT THE SITUATION. BEFORE CONSTRUCTION REVISIONS RELATIVE TO SUCH A BREAKTHROUGH CAN BE ACCEPTED, IT IS NECESSARY TO UNDERSTAND THE MAGNITUDE OF THE PROBLEM. A PROGRESSIVE SOCIETY MUST HAVE A SATISFACTORY TRANSPORTATION SYSTEM BUT IF THE CURRENT TRENDS IN HIGHWAY ACCIDENTS CONTINUE, OUR GRANDCHILDREN WILL EXPERIENCE A CONDITION WHICH WILL BE JUSTLY CLASSIFIED AS "HORRIFYING".

HAVING ESTABLISHED THE PERTINENT TRENDS, THIS PAPER WILL DISCUSS THE ACCIDENT, INJURY AND FATALITY EXPERIENCE THAT WILL EXIST IN THE YEAR 2025 WHEN OUR GRANDCHILDREN WILL BE THE SAME AGE AS WE ARE TODAY. THIS PAPER HAS DISCUSSED A NEW CONCEPT WHICH WILL PROVIDE THIS BREAKTHROUGH AND PRODUCE A VERY SIGNIFICANT REDUCTION IN THE NUMBER OF ACCIDENTS, INJURIES AND FATALITIES.

THE MAJOR PROBLEM IS THE INABILITY TO PREVENT THE RAPID AND CONTINUING GROWTH IN ACCIDENTS, INJURIES AND FATALITIES WHICH FAR EXCEEDS THE INCREASE IN POPULATION AND TRAFFIC.

EVERYTHING EXCEPT TIME, SPACE AND LIFE IS LIMITED IN CAPACITY. FOR THIS REASON IT CAN BE EXPECTED THAT AS POPULATION CONTINUES TO GROW THERE WILL BE A TIME WHEN WE ARE OVERCROWDED.

IT IS EASY TO SEE THAT A CAPACITY LIMIT COULD BE REACHED IN THE NOT TOO DISTANT FUTURE BUT THERE IS PLENTY OF ROOM FOR GROWTH IN THE IMMEDIATE FUTURE. IN NEW JERSEY, WHICH IS THE MOST DENSELY POPULATED STATE IN THE COUNTRY, THERE IS PLENTY OF ROOM AS CAN BE WITNESSED BY ANY AIR TRIP OVER THE STATE; 83 PERCENT OF NEW JERSEY'S LAND AREA IS DEVOTED TO FARMS, WOODED AREAS, ETC.

IT SHOULD BE NOTED THAT THERE IS A POSSIBILITY EARTH IS THE ONLY POPULATED PLACE IN THE UNIVERSE. FURTHERMORE, IT MAY BE THE ONLY PLACE WHERE LIFE OF ANY FORM EXISTS. THIS, COMBINED WITH THE OVERPOPULATED OUTLOOK, SHOULD STIMULATE AND JUSTIFY ACCELERATED EFFORTS IN SPACE EXPLORATION. THIS IS A MORE PROGRESSIVE WAY OF SOLVING THE POPULATION PROBLEMS THAN SUCH DEGRADING EXPRESSIONS AS FORCED BIRTH CONTROL, AND NEED FOR WARS. SOCIETY RECOGNIZES THAT WE DO NOT WANT WARS, WE DESIRE TO PROLONG LIFE BY ELIMINATING CAUSES OF DEATH FROM DISEASE AND ACCIDENTS, INCLUDING MOTOR VEHICLE FATALITIES. A DEPRESSION IS THE ONLY PROVEN WAY OF FORCING BIRTH CONTROL TO THE END THAT POPULATION DECREASES RATHER THAN INCREASES. THIS CERTAINLY IS NOT A POPULAR SOLUTION.

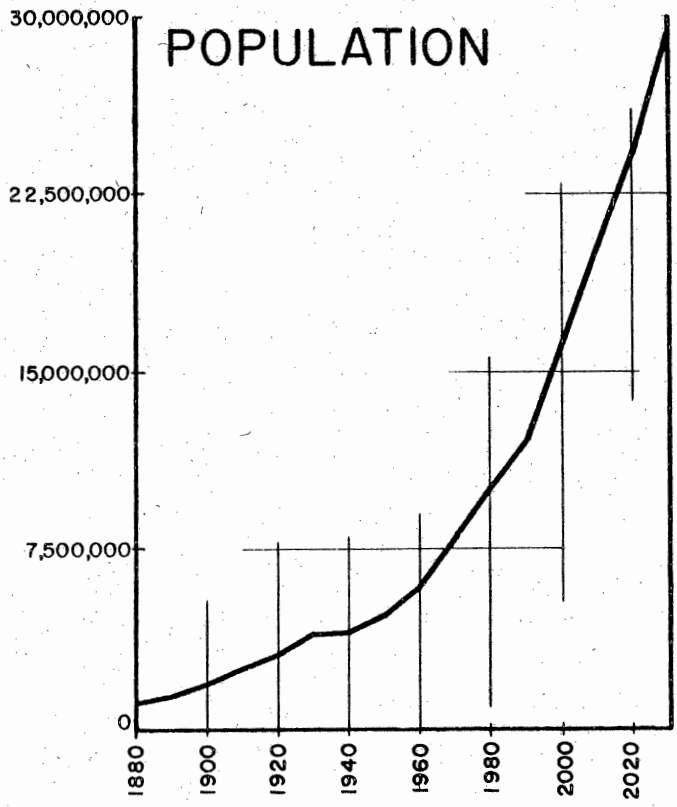
HAVING VISUALIZED A SOLUTION FOR THE DISTANT FUTURE, LET US RETURN TO A SOLUTION FOR THE NOT SO DISTANT FUTURE WITH AN OPTIMISTIC ATTITUDE FOR THE PERIOD PRIOR TO COMMONPLACE SPACE TRAVEL.

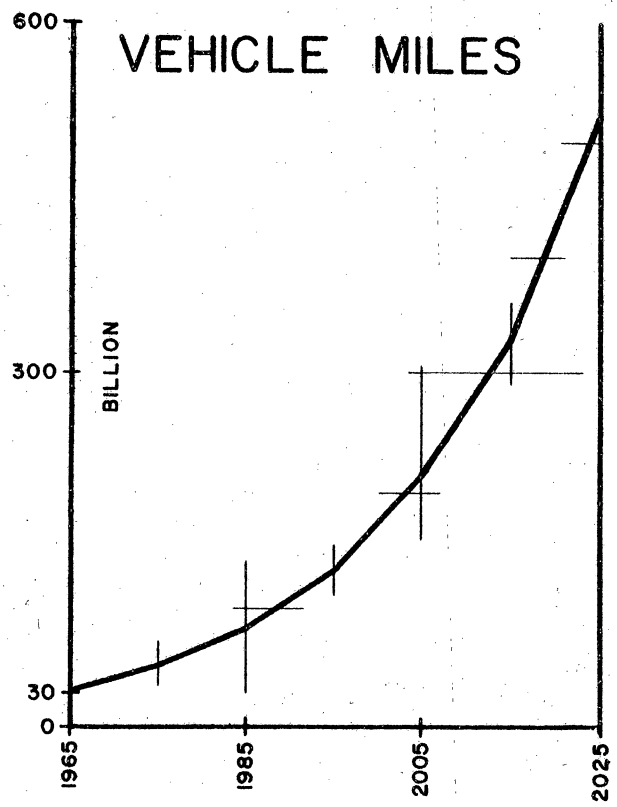
THERE HAS BEEN NO INDICATION THAT THE TRENDS WILL BE ALTERED IN ANY WAY. OUR POPULATION WILL CONTINUE TO INCREASE IN SPITE OF MANY HYSTERICAL FEARS OF OVER-POPULATION. TRAFFIC VOLUMES WILL CONTINUE TO INCREASE AND OUR ACCIDENTS, INJURIES AND FATALITIES WILL ALSO CONTINUE TO INCREASE. THESE TRENDS WILL BE PROJECTED TO THE TIME WHEN OUR GRANDCHILDREN WILL BE THE SAME AGE AS WE ARE NOW.

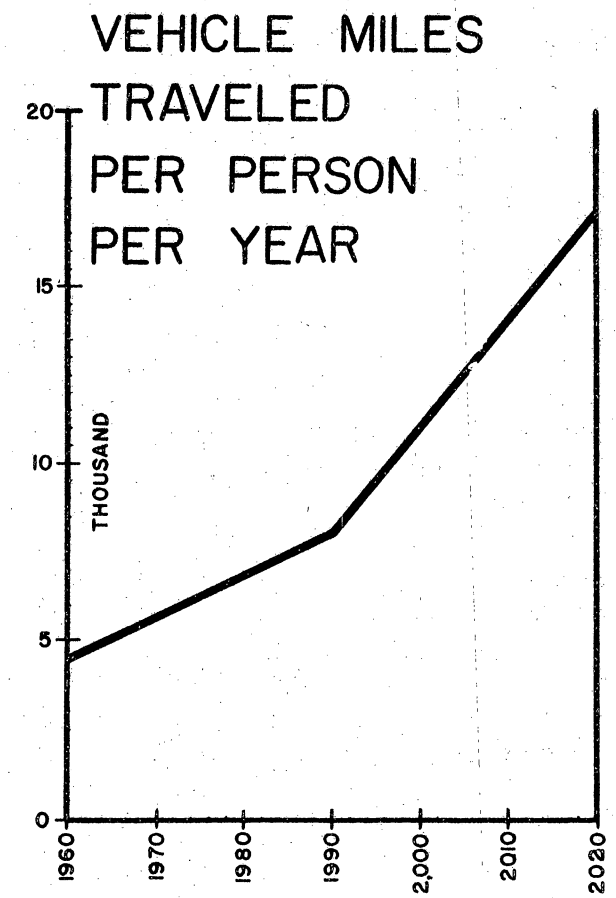
## 7.2 PROJECTIONS

SOME INDIVIDUALS MIGHT CLAIM THAT OUR GROWTH RATE WILL SLOW UP. IF TRUE THE TIME FOR THE SATURATED CONDITION IS DELAYED A FEW YEARS.

IT IS JUST AS POSSIBLE THAT THE GROWTH RATE MAY INCREASE. NO ONE SEEMS TO SUGGEST THAT OUR POPULATION WILL DECREASE AND THIS IS TRUE AS LONG AS WE CAN SOLVE OUR PROBLEMS. DOUBLING EVERY 30 YEARS THE POPULATION OF NEW JERSEY WILL BE 27,000,000 IN THE YEAR 2025 AND VEHICLE MILES DOUBLING EVERY 15 YEARS RESULTS IN 536 BILLION MILES TRAVELED IN 2025. THIS ILLUSTRATES THAT IN THE YEAR 2025 EACH PERSON WILL BE TRAVELING FOUR TIMES AS FAR AS HE TRAVELS NOW.






THE FOLLOWING TABLE SHOWS THE ACCIDENTS, INJURIES AND FATALITIES PER TEN THOUSAND PEOPLE PROJECTED INTO THE FUTURE:

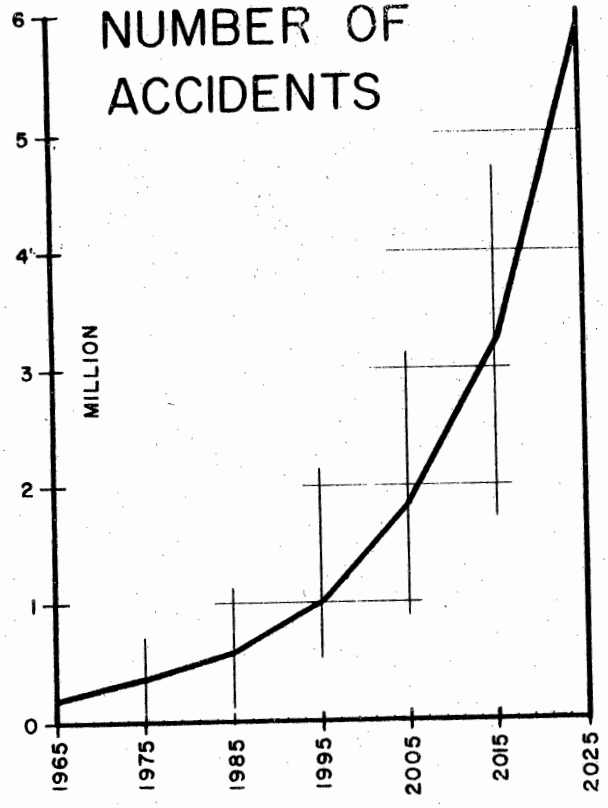
PER TEN THOUSAND PEOPLE

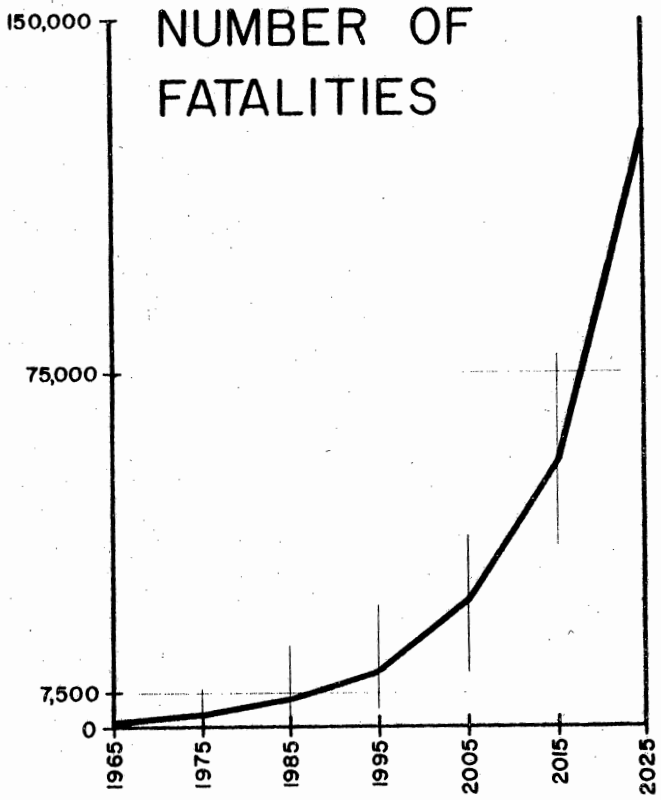
| YEAR | ACCIDENTS | INJURIES | FATALITIES |
|---|---|---|---|
| 1975 | 350 | 310 | 3 |
| 1985 | 505 | 610 | 5 |
| 1995 | 700 | 1150 | 8 |
| 2005 | 1000 | 2150 | 14 |
| 2015 | 1480 | 4280 | 27 |
| 2025 | 2160 | 8300 | 46 |

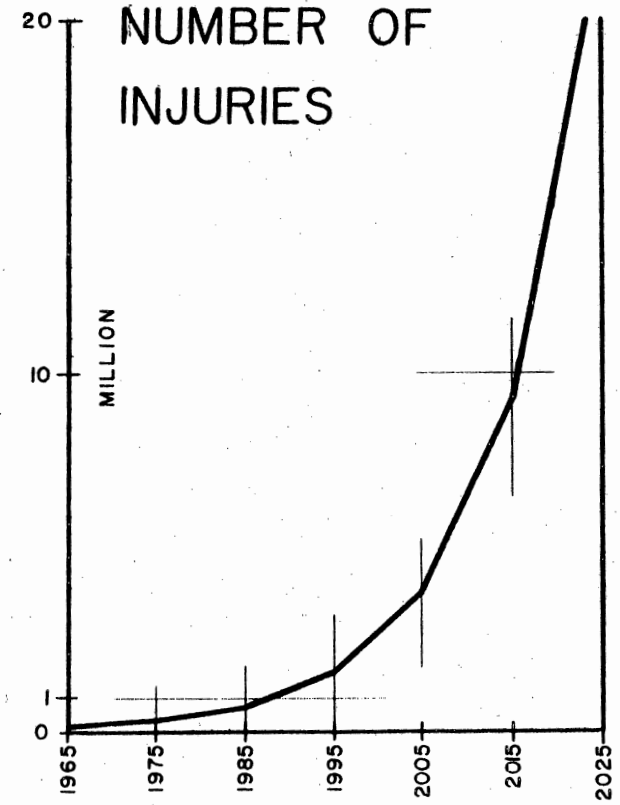
## 7.3 ACCIDENTS IN 2025

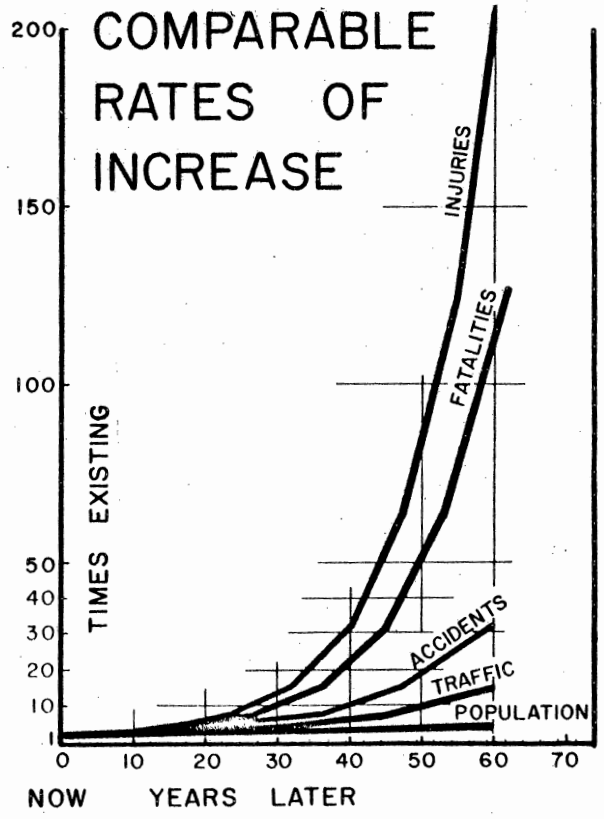
IN THE YEAR 2025 WITH THE CURRENT TREND CONTINUING, THERE WOULD BE 5,670,000 ACCIDENTS IN THAT ONE YEAR IN NEW JERSEY. THIS IS TWICE AS MANY ACCIDENTS AS HAVE OCCURRED IN THE PAST 30 YEARS IN NEW JERSEY, AND IS 31 TIMES THE NUMBER OF ACCIDENTS THAT OCCURRED IN 1966. THERE WOULD BE 20,600,000 INJURIES. THIS COMPARES WITH 1-1/2 MILLION INJURIES THAT HAVE ACCUMULATED IN THE PAST 30 YEARS, AND IS 169 TIMES AS GREAT AS THE NUMBER THAT OCCURRED IN 1966. THERE WOULD BE 128,000 FATALITIES THAT ONE YEAR WHICH IS FIVE TIMES AS MANY FATALITIES AS HAVE ACCUMULATED IN THE LAST 30 YEARS AND IS 114 TIMES AS MANY AS IN 1966 AND MORE THAI TWICE AS MANY AS OCCURRED IN 1966 IN ALL OF THE COUNTRY.

THERE IS A WIDENING GAP BETWEEN ACCIDENTS, INJURIES AND FATALITIES AND THE POPULATION GROWTH. FOR INSTANCE, 10 YEARS FROM NOW THE INJURY RATIO WILL BE THREE TIMES THAT FOR POPULATION, BUT 30 YEARS FROM NOW IT WILL BE SEVEN TIMES THAT FOR POPULATION AND 60 YEARS FROM NOW IT WILL BE 50 TIMES THAT FOR POPULATION.


NUMBER OF ACCIDENTS
MILLION
6
5
4
3
2
1
0
1965
1975
1985
1995
2005
2015
2025


NUMBER OF FATALITIES
150,000
75,000
7,500
0
1965
1975
1985
1995
2005
2015
2025


NUMBER OF INJURIES
MILLION
20
10
1
0
1965
1975
1985
1995
2005
2015
2025

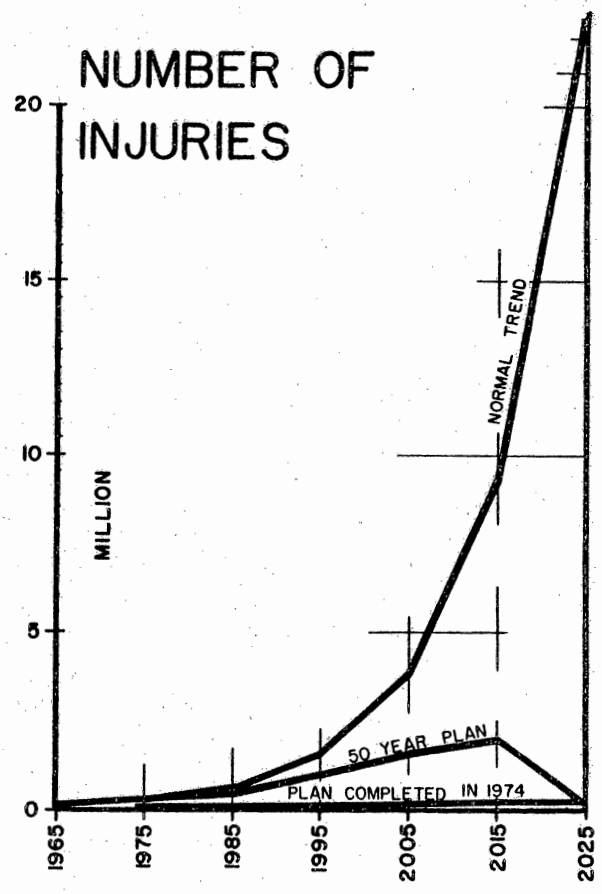

COMPARABLE RATES OF INCREASE
TIMES EXISTING
200
150
100
50
40
30
20
10
1
INJURIES
FATALITIES
ACCIDENTS
TRAFFIC
POPULATION
0
10
20
30
40
50
60
70
NOW
YEARS LATER

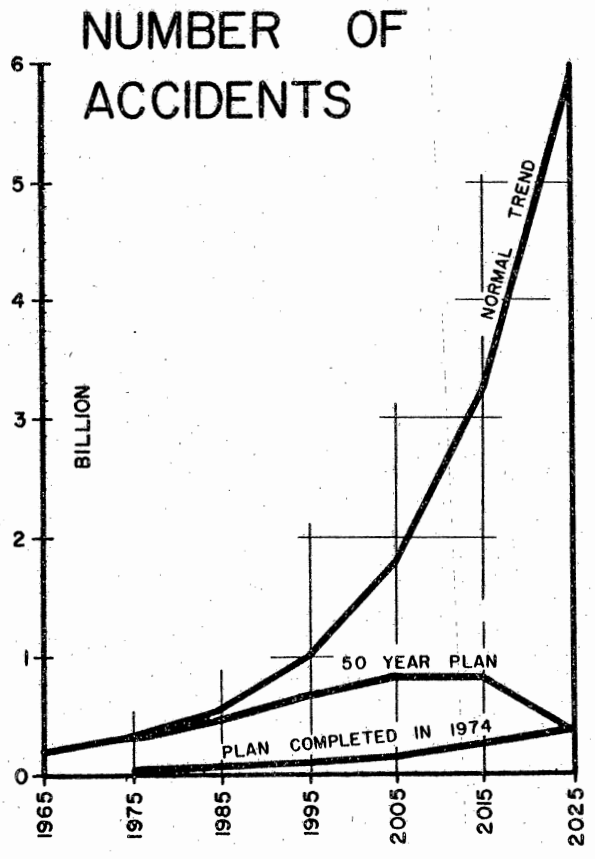
## 7.4 BUDGET POLICIES

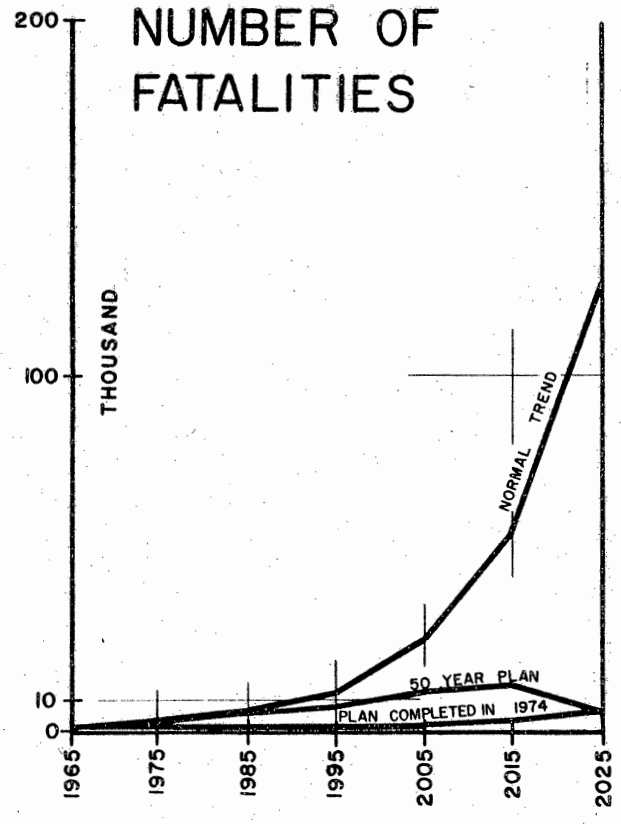
THE BASIS FOR BUDGETING NECESSARY MONIES IS GENERALLY THOUGHT OF AS BEING PARALLEL TO POPULATION GROWTH BUT HIGHWAY NEEDS GROW MUCH FASTER THAN POPULATION AND BUDGETED MONEY IS NOT PROVIDED IN AMOUNTS NECESSARY TO OVERCOME THE PROBLEM. THESE BUDGETS SHOULD BE BASED ON THE GROWTH OF THE PROBLEM AND, IN THIS CASE, IT CAN BE SEEN TO BE FAR IN EXCESS OF POPULATION GROWTH.

## 7.5 BENEFITS OF NEW CONCEPTS

THE BENEFITS CAN BE SHOWN TO JUSTIFY THIS EXPENDITURE. THE DIFFERENCE BETWEEN THE ESTIMATED ACCIDENTS WITHOUT THE NEW CONCEPT AND THE ACCIDENTS EXPERIENCED WITH A PROGRESSIVE CONSTRUCTION PROGRAM ILLUSTRATES THE NUMBER OF ACCIDENTS THAT WOULD BE SAVED. THE NUMBER OF INJURIES SAVED IS SIMILARLY SHOWN AND THE FATALITY SAVINGS.

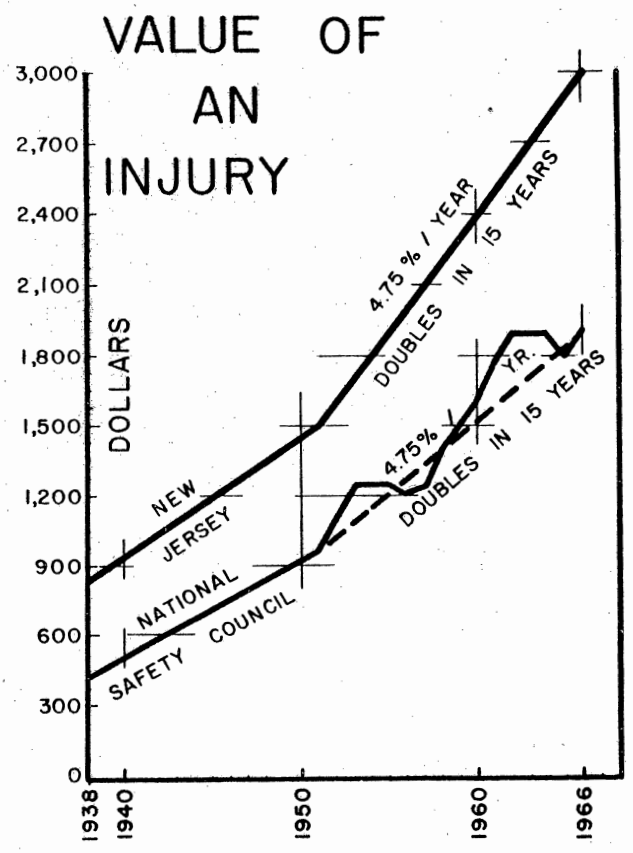


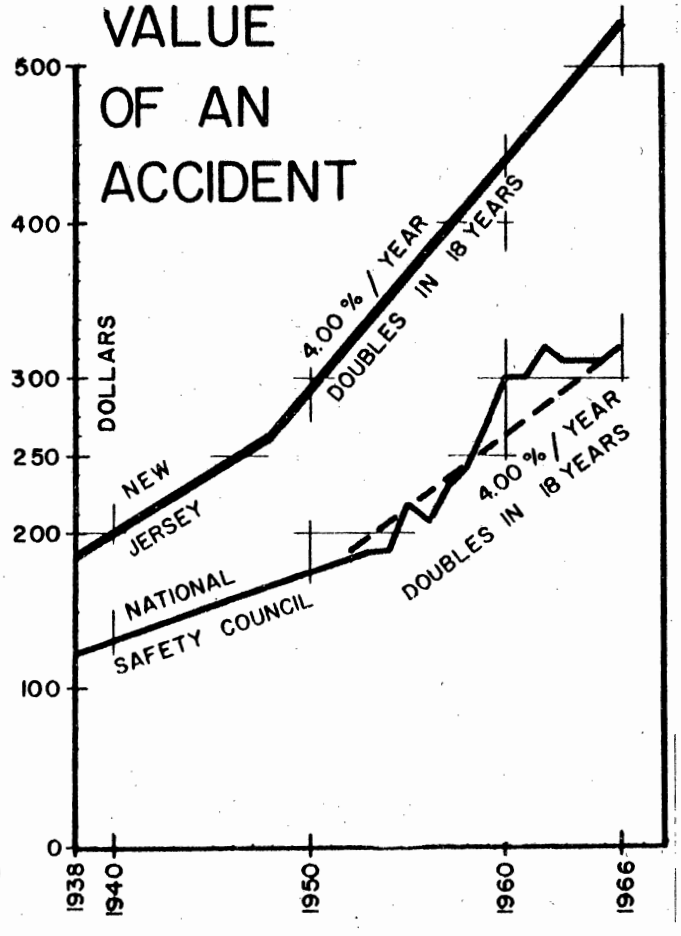



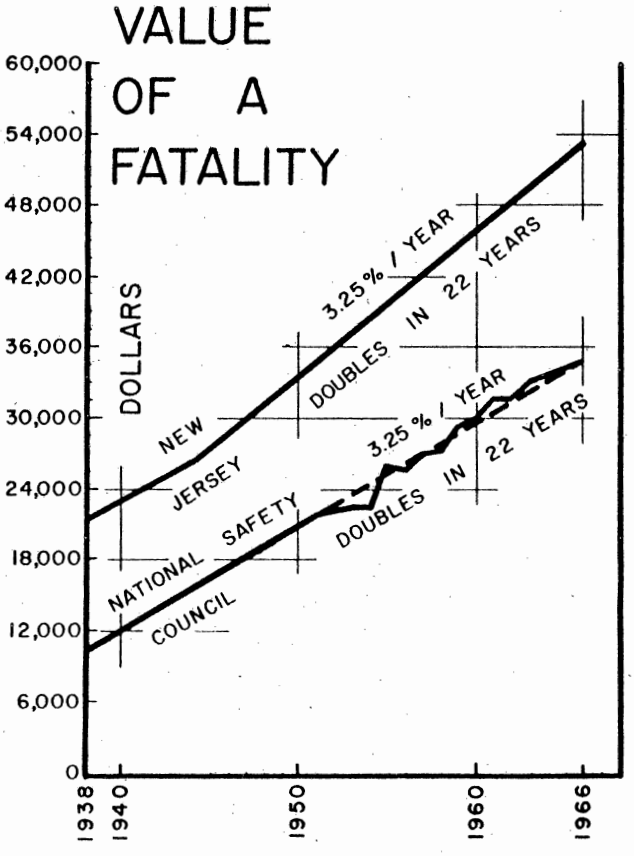



| | ACCIDENTS | INJURIES | FATALITIES |
|---|---|---|---|
| 2025 WITHOUT NEW CONCEPT | 5,670,000 | 20,600,000 | 128,000 |
| 2025 WITH NEW CONCEPT | 375,000 | 268,000 | 5,360 |
| 1966 | 183,024 | 122,091 | 1,127 |

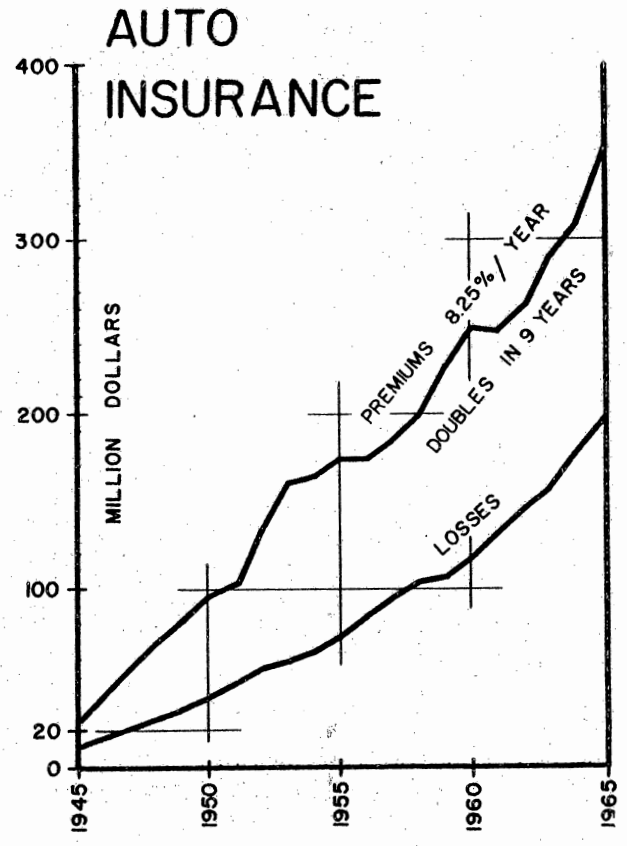
USING NATIONAL SAFETY COUNCIL VALUES FOR 1966 OF AN ACCIDENT VALUED AT $320, AN AVERAGE INJURY AT $1,900 AND A FATALITY AT $35,000, THE SAVINGS WOULD AMOUNT TO $441.5 BILLION DOLLARS. THE COST OF ACCIDENTS, INJURIES AND FATALITIES IN NEW JERSEY IS HIGHER THAN FOR THE NATIONAL AVERAGE. NEW JERSEY VALUES FOR 1966 ARE ESTIMATED AT $520 FOR AN ACCIDENT, $3,000 FOR AN INJURY AND $53,000 FOR A FATALITY. THIS GIVES A SAVINGS EQUAL TO $695.3 BILLION DOLLARS.



USING NATIONAL AVERAGES, THE BENEFITS ARE 12.6 TIMES THE COST OF CONSTRUCTION, AND USING NEW JERSEY VALUES THE BENEFITS ARE 20 TIMES THE COST OF CONSTRUCTION. THIS IS BASED ON TODAY'S MONEY VALUES. THE BENEFITS OUTWEIGH THE COST BY A MUCH GREATER FIGURE THAN THIS. THE BENEFITS ARE DERIVED AT A LATER PERIOD THAN THE CONSTRUCTION. THE GENERAL ECONOMY OF OUR COUNTRY IS ON A STEADY INCREASE. TODAY'S DOLLAR WILL BE EQUAL TO TWO DOLLARS 25 YEARS FROM NOW. THIS IS AN INCREASE OF 2.75 PERCENT PER YEAR. IF CONSTRUCTION DONE IN ONE YEAR PRODUCES BENEFITS DISTRIBUTED OVER A PERIOD OF 50 YEARS, THE AVERAGE YEAR FOR ESTIMATING THE BENEFITS WOULD BE 25 YEARS AFTER CONSTRUCTION AT WHICH TIME THE VALUE OF THE BENEFITS WOULD BE TWICE THAT ESTIMATED ON THE CONSTRUCTION YEAR MONEY BASIS. THEREFORE, THE BENEFIT COST RATIO WOULD BE SHOWN AS BEING 40 TO 1. IT IS NOT DIFFICULT, THEREFORE, TO SHOW A STRONG JUSTIFICATION FOR THE EXPENDITURE OF THIS CONSTRUCTION MONEY.




## 8. FINANCE

### 8.1 AUTO INSURANCE COSTS

THE COST OF CONSTRUCTION COULD EASILY BE PAID FOR OUT OF THE SAVINGS IN REDUCED INSURANCE PREMIUMS DURING THE 50 YEARS. AUTOMOBILE INSURANCE PREMIUMS PAID FOR BY THE PEOPLE OF NEW JERSEY HAVE BEEN GROWING AT THE RATE OF 8.25 PERCENT PER YEAR WHICH IS EQUAL TO DOUBLING IN 9 YEARS. A PROJECTION OF THE INCREASING TREND WOULD INDICATE THAT IN THE YEAR 2025, 35.8 BILLION DOLLARS WOULD BE PAID IN AUTOMOBILE INSURANCE PREMIUMS.

### 8.2 REDUCED ACCIDENTS - REDUCED PREMIUMS

ASSUMING THAT A 25 PERCENT REDUCTION FOR ALL ACCIDENTS, INJURIES AND FATALITIES WOULD RESULT IN A 25 PERCENT REDUCTION IN PREMIUMS AND A 50 PERCENT REDUCTION IN ACCIDENTS, INJURIES AND FATALITIES WOULD RESULT IN A 50 PERCENT REDUCTION IN PREMIUMS, ETC., WE CAN ARRIVE AT A SAVINGS IN INSURANCE PREMIUMS BASED ON THE PERCENTAGE REDUCTION IN ACCIDENTS, INJURIES AND FATALITIES. THIS SAVINGS IN INSURANCE PREMIUMS OVER A 50-YEAR PERIOD IS 348.8 BILLION DOLLARS. IN ADDITION TO THIS SAVINGS, THERE WOULD BE THE BENEFIT COST RATIO OF 40 TO 1 MENTIONED ABOVE WHICH COVERS A SAVINGS OF 64 MILLION ACCIDENTS, 199 MILLION INJURIES AND 1,244,000 LIVES.

### 8.3 FINANCE THROUGH % OF PREMIUM REDUCTION

THERE SHOULD BE A WAY OF PAYING FOR THE $35 BILLION CONSTRUCTION COST FROM PART OF THE $348.8 BILLION SAVED IN ACCIDENT PREMIUMS.

## 9. CONCLUSIONS

### 9.1 ONE WAY HIGHWAYS

IN ANTICIPATION OF THE POSSIBILITY OF SUCH A PROGRAM IT IS ADVISABLE TO UTILIZE SOME OF OUR EXISTING HIGHWAYS AS ONE-WAY HIGHWAYS IN ORDER TO ACQUAINT DRIVERS WITH THIS TYPE OF FACILITY. THESE ONE-WAY HIGHWAYS CAN BE INDEPENDENT OF THE OPPOSITE DIRECTION OF TRAVEL.

### 9.2 MASTER PLAN

WHEN CONSTRUCTION IMPROVEMENTS ARE MADE, THEY SHOULD CONFORM TO THE OVERALL COMPREHENSIVE MASTER PLAN PREPARED FOR THE STATE OF NEW JERSEY WHICH EMBRACES THE NEW CONCEPT.

### 9.3 CONSTRUCTION PRIORITY

CONSTRUCTION PRIORITY SHOULD BE GIVEN TO AREAS WHERE INSURANCE PREMIUMS ARE HIGHEST THEREBY OBTAINING BENEFITS AT THE EARLIEST POSSIBLE DATE.

BASE PREMIUMS
P-CARS

| | 10-20-5 | 100-300-25 |
|---|---|---|
| ATLANTIC CITY | $106 | $139 |
| NEWARK | 105 | 138 |
| JERSEY CITY | 101 | 132 |
| CAMDEN | 100 | 130 |
| PERTH AMBOY | 88 | 117 |
| BAYONNE | 88 | 115 |
| ELIZABETH | 79 | 103 |
| LONG BRANCH | 78 | 103 |

BASE PREMIUMS (CONT'D)
P-CARS

| | 10-20-5 | 100-300-25 |
|---|---|---|
| EAST ORANGE-ORANGE | $ 77 | $100 |
| NEWARK SUBURBAN | 77 | 100 |
| SOUTHERN BERGEN CO. | 73 | 95 |
| NEWARK SEMI-SUBURBAN | 73 | 95 |
| CAMDEN CO. (BALANCE) | 72 | 94 |
| CAMDEN SUBURBAN | 72 | 94 |
| HUDSON CO. (BALANCE) | 71 | 93 |
| PATERSON | 70 | 90 |
| NORTHERN BERGEN CO. | 69 | 89 |
| MONMOUTH CO. (BALANCE) | 68 | 89 |
| TRENTON | 67 | 86 |
| ESSEX CO. (BALANCE) | 64 | 82 |
| NEW BRUNSWICK | 63 | 82 |
| PLAINFIELD | 63 | 82 |
| ATLANTIC CO. (BALANCE) | 61 | 80 |
| CAPE MAY CO. | 61 | 80 |
| CUMBERLAND CO. | 61 | 80 |
| OCEAN CO. | 61 | 80 |
| SALEM CO. | 56 | 73 |
| BURLINGTON CO. (BALANCE) | 56 | 73 |
| GLOUCESTER CO. (BALANCE) | 56 | 73 |
| SOMERVILLE | 54 | 70 |
| MORRISTOWN | 54 | 70 |
| DOVER | 54 | 70 |
| TRENTON SUBURBAN | 48 | 61 |
| WARREN CO. | 45 | 57 |
| HUNTERDON CO. | 45 | 57 |

### 9.4 PUBLIC SUPPORT

PUBLIC SUPPORT FOR SUCH A PLAN IS NECESSARY BUT UNLESS THE PUBLIC IS INFORMED OF THE INEVITABLE FUTURE, THE NUMBER OF ACCIDENTS, INJURIES AND FATALITIES WILL GET VERY MUCH WORSE BEFORE IT GETS BETTER.

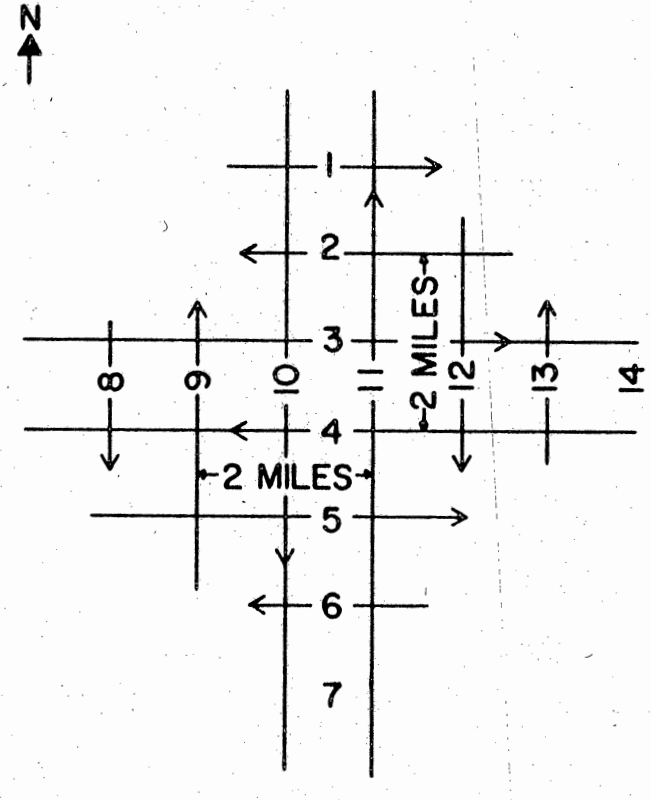
## VEHICLE MILES

INCREASE 4.75% PER YEAR

DOUBLES EVERY 15 YEARS

| | |
|---|---|
| 1965 | 33,000,000,000 |
| 1975 | 52,500,000,000 |
| 1985 | 83,600,000,000 |
| 1995 | 133,000,000,000 |
| 2005 | 212,000,000,000 |
| 2015 | 337,000,000,000 |
| 2025 | 536,000,000,000 |

## B-WAYS




## NUMBER OF ACCIDENTS - STATEWIDE

INCREASE 6% PER YEAR

DOUBLES EVERY 12 YEARS

### NORMAL TREND

| | |
|---|---|
| 1965 | 171,556 |
| 1975 | 307,000 |
| 1985 | 550,000 |
| 1995 | 985,000 |
| 2005 | 1,770,000 |
| 2015 | 3,160,000 |
| 2025 | 5,670,000 |

IF PLAN IS ACCOMPLISHED IN ONE YEAR (1974) AND USING RATE - 70 ACC./100 M.C.M.

| | |
|---|---|
| 1965 | 171,556 |
| 1975 | 36,800 |
| 1985 | 58,500 |
| 1995 | 93,000 |
| 2005 | 148,000 |
| 2015 | 236,000 |
| 2025 | 375,000 |

NUMBER OF ACCIDENTS WITH NEW CONCEPT APPLIED EVENLY OVER 50 YEARS (1975 - 2025)

1975 = 307,000

1985 = 451,700 =
(550,000 - 58,500) 4/5 + 58,500

1995 = 628,200 =
(985,000 - 93,000) 3/5 + 93,000

2005 = 796,800 =
(1,770,000 - 148,000) 2/5 + 148,000

2015 = 820,800 =
(3,160,000 - 236,000) 1/5 + 236,000

2025 = 375,000

TOTAL ACCIDENTS SAVED

1975-1985 = 491,500 =
(550,000 - 451,700) 1/2 x 10

1985-1995 = 2,279,000 =
(550,000 - 451,700 + 985,000 - 628,200) 1/2 x 10

1995-2005 = 6,650,000 =
(985,000 - 628,200 + 1,770,000 - 796,800) 1/2 x 10

2005-2015 = 16,560,000 =
(1,770,000 - 796,800 + 3,160,000 - 820,800) 1/2 x 10

2015-2025 = 38,171,000 =
(3,160,000 - 820,800 + 5,670,000 - 375,000) 1/2 x 10

50-YR TOTAL 64,153,500

AT $320/ACC = $20.5 BILLION

AT $520/ACC = $33.4 BILLION

## NUMBER OF INJURIES - STATEWIDE

INCREASE 9% PER YEAR

DOUBLES EVERY 8 YEARS

NORMAL TREND

| | |
|---|---|
| 1965 | 117,160 |
| 1975 | 277,000 |
| 1985 | 656,000 |
| 1995 | 1,550,000 |
| 2005 | 3,680,000 |
| 2015 | 8,720,000 |
| 2025 | 20,600,000 |

IF PLAN IS ACCOMPLISHED IN ONE YEAR (1975) AND USING RATE = 50 INJ./100 M.C.M.

| | |
|---|---|
| 1965 | 117,160 |
| 1975 | 26,250 |
| 1985 | 41,800 |
| 1995 | 66,500 |
| 2005 | 106,000 |
| 2015 | 168,500 |
| 2025 | 268,000 |

## NUMBER OF INJURIES WITH NEW CONCEPT APPLIED EVENLY OVER 50 YEARS (1975 - 2025)

1975 = 277,000

1985 = 533,200 =
(656,000 - 41,800) 4/5 + 41,800

1995 = 956,000 =
(1,550,000 - 66,500) 3/5 + 66,500

2005 = 1,535,600 =
(3,680,000 - 106,000) 2/5 + 106,000

2015 = 1,878,800 =
(8,720,000 - 168,500) 1/5 + 168,500

2025 = 268,000

## TOTAL INJURIES SAVED

1975-1985 = 614,000

(656,000 - 533,200) 1/2 x 10

1985-1995 = 3,581,000

(656,000 - 533,200 + 1,550,000 - 956,600) 1/2 x 10

1995-2005 = 13,689,000

(1,550,000 - 956,600 + 3,680,000 - 1,535,600) 1/2 x 10

2005-2015 = 44,928,000

(3,680,000 - 1,535,600 + 8,270,000 - 1,878,800) 1/2 x 10

2015-2025 =135,861,000

(8,720,000 - 1,878,800 + 20,600,000 - 268,000) 1/2 x 10

50-YR TOTAL 198,673,000

AT $1,900/INJ. = $377.5 BILLION

AT $3,000/INJ. = $596.0 BILLION

## NUMBER OF FATALITIES - STATEWIDE

INCREASE 8.25% PER YEAR

DOUBLES EVERY 9 YEARS

### NORMAL TREND

| | |
|---|---|
| 1965 | 1,095 |
| 1975 | 2,420 |
| 1985 | 5,350 |
| 1995 | 11,800 |
| 2005 | 26,200 |
| 2015 | 57,800 |
| 2025 | 128,000 |

IF PLAN IS ACCOMPLISHED IN ONE YEAR (1974) AND USING RATE = 1 FATALITY/100 M.C.M.

| | |
|---|---|
| 1965 | 1,095 |
| 1975 | 525 |
| 1985 | 836 |
| 1995 | 1,330 |
| 2005 | 2,120 |
| 2015 | 3,370 |
| 2025 | 5,360 |

NUMBER OF FATALITIES WITH NEW CONCEPT APPLIED EVENLY OVER 50 YEARS (1975 - 2025)

1975 = 2,420

1985 = 4,447
(5,350 - 836) 4/5 + 836

1995 = 7,612
(11,800 - 1,330) 3/5 + 1,330

2005 = 11,752
(26,200 - 2,120) 2/5 + 2,120

2015 = 14,256
(57,800 - 3,370) 1/5 + 3,370

2025 = 5,360

TOTAL FATALITIES SAVED

1975-1985 = 4,515
(5,350 - 4,447) 1/2 x 10

1985-1995 = 25,455
(5,350 - 4,447 + 11,800 - 7,612) 1/2 x 10

1995-2005 = 93,180
(11,800 - 7,612 + 26,200 - 11,752) 1/2 x 10

2005-2015 = 289,960
(26,200 - 11,752 + 57,800 - 14,256) 1/2 x 10

2015-2025 = 830,920
(57,800 - 14,256 + 128,000 - 5,360) 1/2 x 10

50-YR TOTAL 1,244,030

AT $35,000/FAT. = $43.5 BILLION

AT $53,000/FAT. = $65.9 BILLION

## NATIONAL SAFETY COUNCIL VALUES

| YEAR | DEATH | NONFATAL INJURY | PROPERTY DAMAGE ACCIDENT |
|---|---|---|---|
| PRIOR TO 1938 | $11,500 | $ 425 | $125 |
| 1951 | 21,800 | 950 | 180 |
| 1952 | --- | --- | --- |
| 1953 | 22,600 | 1,250 | 190 |
| 1954 | 22,600 | 1,250 | 190 |
| 1955 | 25,800 | 1,250 | 220 |
| 1956 | 25,400 | 1,200 | 210 |
| 1957 | 27,400 | 1,250 | 230 |
| 1958 | 27,700 | 1,400 | 240 |
| 1959 | 29,200 | 1,500 | 270 |
| 1960 | 30,000 | 1,600 | 300 |
| 1961 | 31,500 | 1,750 | 300 |
| 1962 | 31,800 | 1,900 | 320 |
| 1963 | 33,300 | 1,900 | 310 |
| 1964 | 33,900 | 1,900 | 310 |
| 1965 | 34,400 | 1,800 | 310 |
| 1966 | 35,000 | 1,900 | 320 |
| | NEW JERSEY VALUES | | |
| 1965 | 52,000 | 2,800 | 500 |
| 1966 | 53,000 | 3,000 | 520 |

## 50 YEAR SAVINGS

### NATIONAL SAFETY COUNCIL

### 1966 NATIONAL AVERAGES

| | | |
|---|---|---|
| ACC. | ($320) = | $ 20.5 BILLION |
| INJ. | ($1,900) = | 377.5 BILLION |
| FAT. | ($35,000) = | 43.5 BILLION |
| | | $441.5 BILLION |

### AT VALUES APPLICABLE TO NEW JERSEY FOR 1966

| | | |
|---|---|---|
| ACC. | ($520) = | $ 33.4 BILLION |
| INJ. | ($3,000) = | 596.0 BILLION |
| FAT. | ($53,000) = | 65.9 BILLION |
| | | $695.3 BILLION |

## INSURANCE PREMIUMS

## 50 YEAR PLAN

| YEAR | TREND PROJECTED | % SAVED | YEARLY SAVING | 10 YEAR SAVING |
|---|---|---|---|---|
| 1975 | 756,000,000 | 0 | $ 0 | $ 0 |
| 1985 | 1,646,000,000 | 18 | 295,000,000 | 1,475,000,000 |
| 1995 | 3,600,000,000 | 36 | 1,296,000,000 | 7,955,000,000 |
| 2005 | 5,800,000,000 | 56 | 3,248,000,000 | 22,720,000,000 |
| 2015 | 16,700,000,000 | 77 | 12,859,000,000 | 80,530,000,000 |
| 2025 | 35,800,000,000 | 96 | 34,368,000,000 | 236,135,000,000 |
| | | | TOTAL SAVED | $348,815,000,000 |

NOTE INCREASE = 8.25% PER YEAR

DOUBLES EVERY 9 YEARS