PDHonline Course C656 (6 PDH)

Road to Everywhere: The Eisenhower Interstate Highway System

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Road to Everywhere
The Eisenhower Interstate Highway System

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Part 1

To New Horizons

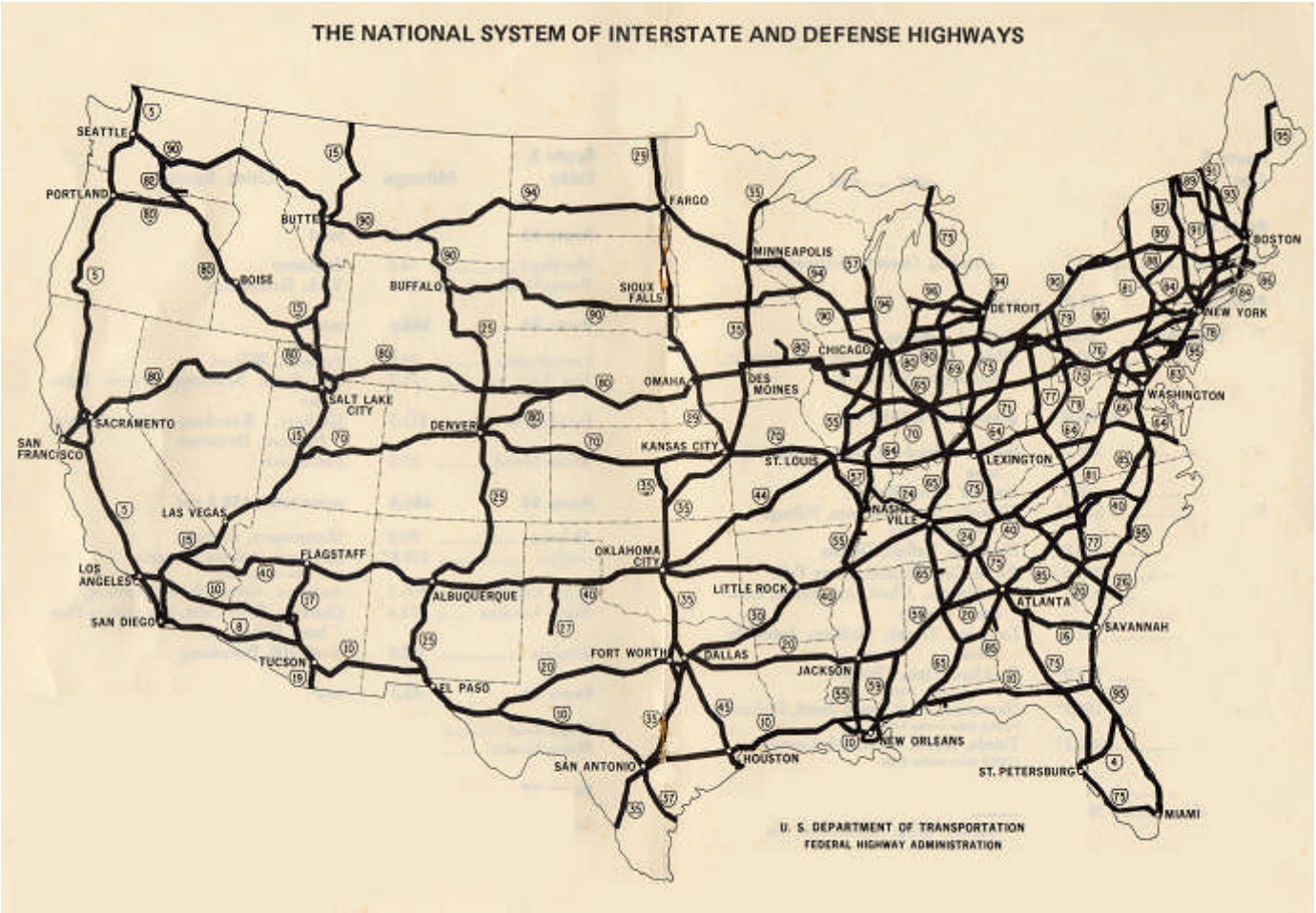
Greatest Highway System Ever Conceived

"It will be the greatest highway system ever conceived by man and will link 48 states and 209 big cities with multi-lane, high-speed freeways…"

***Bureau of Public Roads* (BPR), 1956**

"More than any single action by the government since the end of the war, this one would change the face of America with straightaways, cloverleaf turns, bridges, and elongated parkways. Its impact on the American economy - the jobs it would produce in manufacturing and construction, the rural areas it would open up - was beyond calculation."

POTUS *Dwight D. Eisenhower* (1963)



"…On the national system of Interstate Highways you'll be able to drive from Newport News, Va., right into the heart of San Francisco – or from Houlton, ME, to San Diego – or from Miami to Seattle – without once stopping for a red light, pedestrian, cross-road, railroad track or toll-house. Two things will make the Interstate system different from today's superhighway and toll roads: (1) its tremendous size; (2) the wide range of services it will provide…"

***Popular Science,* May 1956**

<u>Above</u>: caption: "The National System of Interstate and Defense Highways"

"…Transcontinental trips of over 3,000 miles with no stops except for food, sleep or gasoline are just one indication of its size. The Interstate will be a network of 4-, 6- and 8-lane freeways that will extend 40,000 miles. The proposed system of roads will:

- ***Connect all 48 states;***
- ***Join 209 of the nation's 232 cities of more than 50,000 population;***
- ***Take you to, or near, the center of each city it reaches by means of 6,700 miles of multi-lane direct routes or spurs, sometimes elevated over city streets;***
- ***Pass through, and connect, all farm belts and all sources of raw materials such as oil, timber, uranium and coal***

The Interstate represents a major change in U.S. highway thinking…"

***Popular Science,* May 1956**

<u>Above</u>: caption: "The Bureau of Public Roads developed an exhibit in 1957 - one of many over the years - to let the public know about the 'controlled access Interstate System being built under the Federal-Aid Highway Act of 1956.'"

"When I was a boy, most roads were only a few miles long and ran only to the nearest railroad stations. Then they joined towns. Next they joined cities. The Interstate will indeed connect cities – most of them. But its concept goes much further. Like the street system of a town, the Interstate is designed not just to link several points, but to serve an entire area. That area is the United States. The Interstate will not be a new ribbon of road. It will be, instead, the framework of the whole U.S. highway system. I think we've got to have it.."

***R.E. Royall* - Chief of Research, *Bureau of Public Roads* (1956)**

Consensus Opinion

"…Many persons agree. So many, in fact, that the Interstate is hardly questioned at all in vigorous debate on highways now going on in Congress. A bill now before Congress proposes that the U.S. provide 90 percent of the funds, with the states adding 10 percent, a new high percentage for Federal money for roads. But even without any increase in Washington's percentage, which would speed up construction, the Interstate is certain to be built. That's because it has been planned by the highway departments of the states themselves to meet the urgent needs of U.S. drivers…"

***Popular Science,* May 1956**

1) It Will Carry You to Work

"…It may surprise you to learn that this continental network is designed to get a great many people to their jobs. But it is. Around 80 percent of U.S. citizens drive to work. Many live in suburbs. Around 80 to 90 percent of all cars approaching any city are going to that city – not through it. A No. 1 military requirement for U.S. highways is not that they permit the movement of mass armies – it is, instead, that they help keep war workers at war production. That's the big reason for those freeways that will lead into every city on the Interstate. They will reach the centers of the cities, and they will thereby reach seven-eighths of the nation's manufacturing and industrial facilities. Plans for entrances into 102 cities were announced by the Bureau of Public Roads last September – the final detail in completing the design of the Interstate…"
***Popular Science,* May 1956**

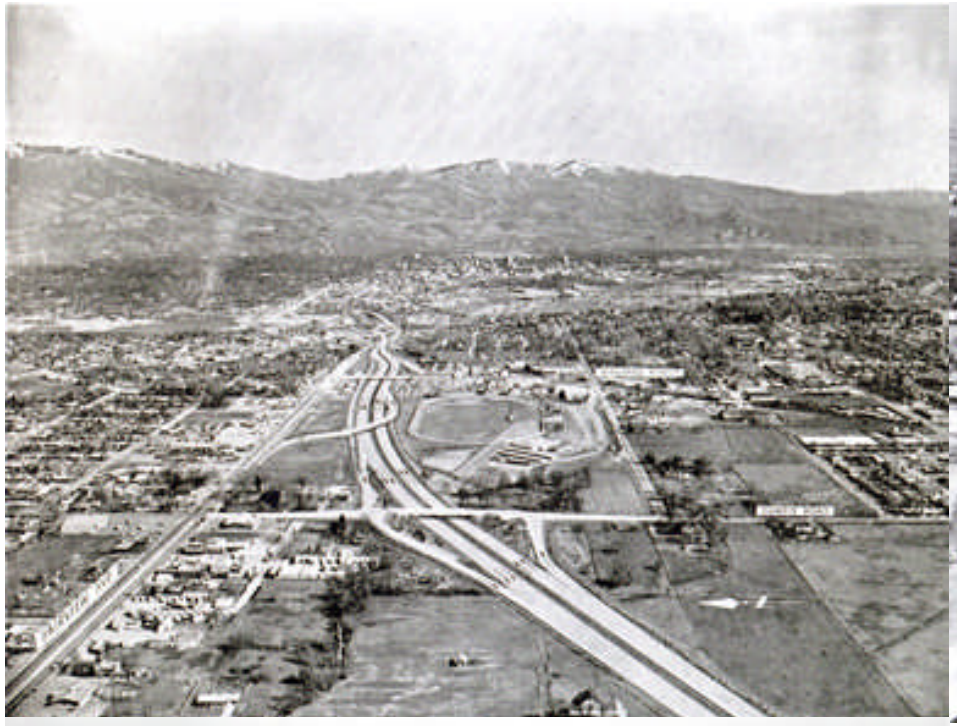
<u>Top Left</u>: caption: "Junction of Interstate 59 and 65- Birmhingham in background."

<u>Top Right</u>: caption: "California - Interstate Route 10, the Santa Monica Freeway, meets the Harbor Freeway in Los Angeles at an interchange designed for extremely heavy traffic movements."

<u>Left</u>: caption: "Washington, D.C. - Interstate Route 95 (now I-395) carries 52,000 vehicles daily into and out of Washington, D.C., not far from the Nation's Capitol. Presently blocked-off lanes will connect with the inner loop, I-295, under construction."

<u>Above</u>: caption: "Georgia - An aerial view of the interchange in Atlanta between Interstate Routes 20 (right & left) and 75 (bottom & top). Atlanta's new major league stadium dominates the foreground and the ever-changing skyline makes a striking backdrop."

<u>Left</u>: caption: "Hawaii Lunalilo Freeway, Honolulu: vicinity of Middle Street"



<u>Top Left</u>: caption: "Idaho - Looking east on revised photograph of the Interstate spur leading into Boise. The section beyond Orchard Street is under construction and the section in lower half of the photo is advertised for bids July 1967. Looking east."

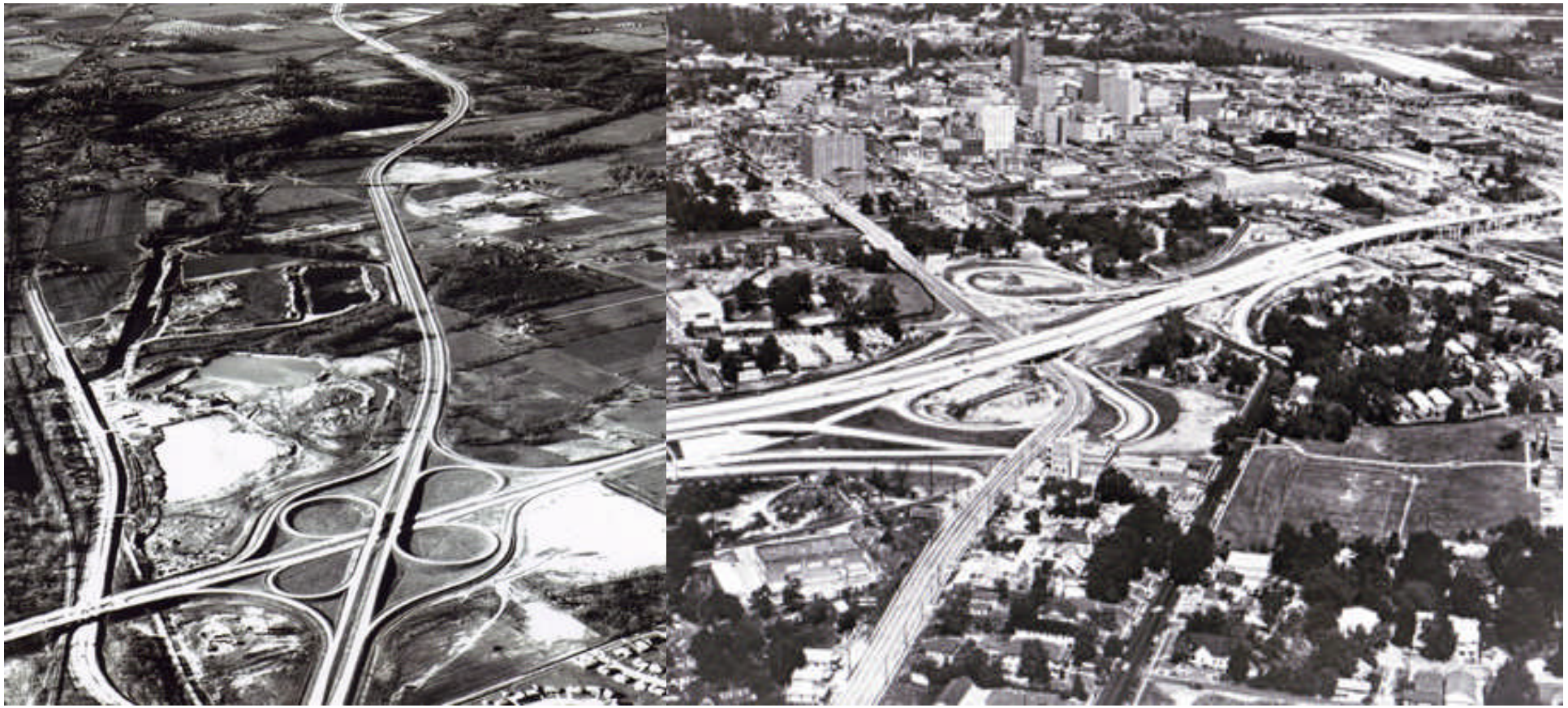
<u>Top Right</u>: caption: "Idaho - Interstate Route 15, here skirting Idaho Falls, is open to traffic for 57 miles north from Pocatello."

<u>Left</u>: "Congress St. Expressway (Interstate 90) from 17th St. overpass looking East, showing depressed section with good landscaping, steel cable guard rail, 10 foot paved shoulder, 24 foot median. Residential Area. Chicago, Illinois."

<u>Top Left</u>: caption: "Interstate 90 (Congress St. Expressway) View of expressway thru Post Office Building looking east showing west side of expressway and building, Chicago, Ill."

<u>Top Right</u>: caption: "View of Northwest Expressway sowing a section of reversible roadway with 6 lanes of traffic. Looking West from Augusta Blvd. Chicago, Illinois."

<u>Left</u>: "View of Northwest Expressway showing heavy traffic during peak period. Looking East between Augusta Blvd. and Division Street, C&NW RR on Left. Chicago, Ill."



Left: caption: "Indiana - Interstate Routes 74 & 465 meet on the west side of Indianapolis. Interstate 465, running across the picture, is part of the Indianapolis circumferential freeway."

Right: caption: "Louisiana - The Shreveport Expressway, part of Interstate Route 20, skirts the southwest edge of the city's downtown area. (under construction when photographed).

<u>Top Left</u>: caption: “Massachusetts - Shown in the lower foreground are concrete promenade areas for the Fall River City complex that will be constructed over this depressed segment of Interstate I-95.”

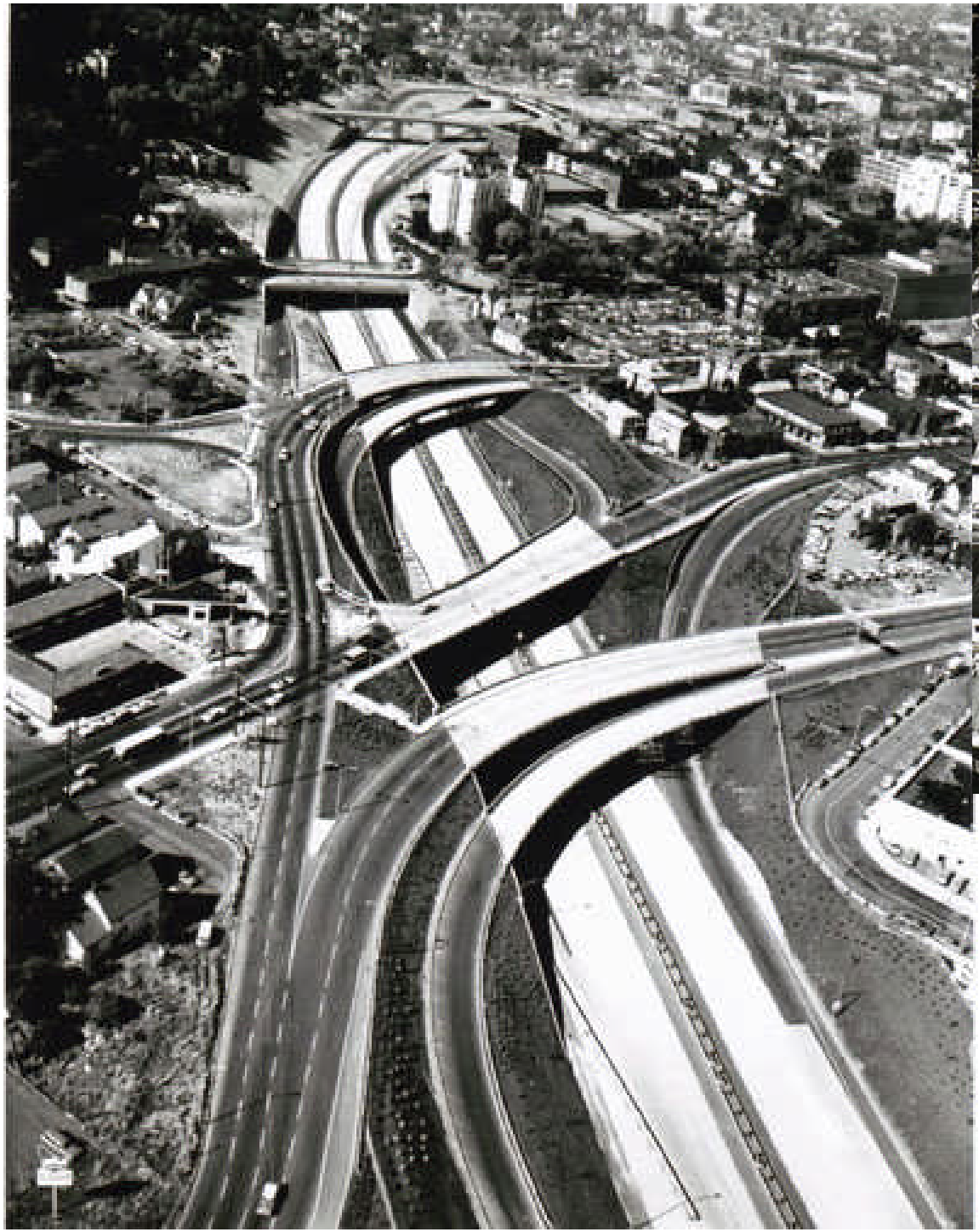
<u>Top Right</u>: caption: “Michigan, Detroit. Aerial view looking NE along Ford Expressway from vicinity of Grand River Avenue intersection area.”

Top Left: caption: "Three miles of Interstate Route 75, the Walter Chrysler Freeway (upper right), from the downtown business district of Detroit, to Interstate Route 94, the Edsel Ford Freeway, were completed in June 1964. (Not yet finished when photographed)."

Top Right: caption: "Missouri - The Kansas City central business district, looming in the distance above, is shown close up below, served by the Inner loop section of I-70. (construction was underway at the time of this photograph)."

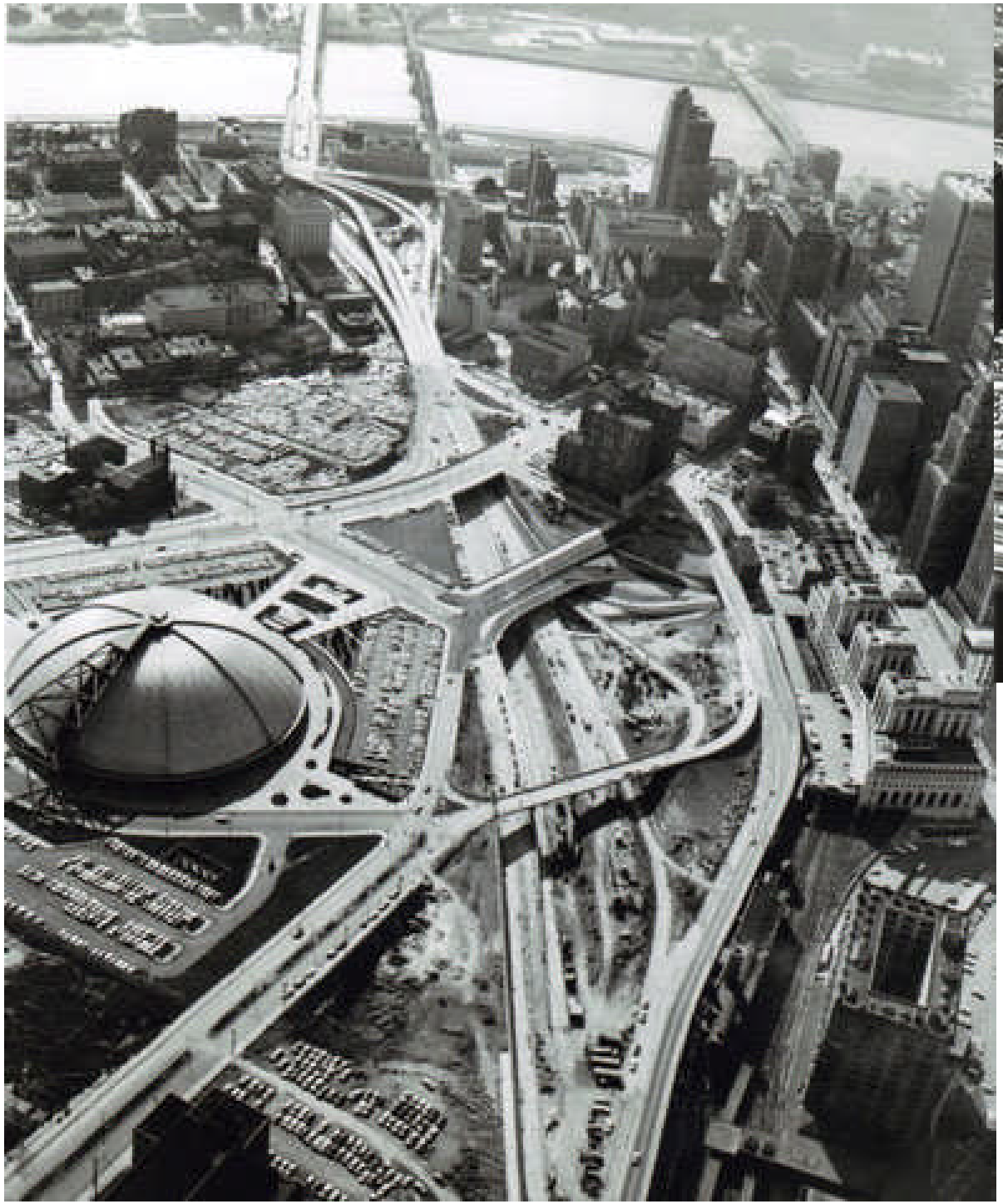
Left: caption: "Montana - Interstate Route 15 traverses flat land as it bypasses Helena; the interchange with U.S. 12 providing ready access into town via two one-way streets. The Continental Divide looms in the distance."

<u>Top Left</u>: caption: "Nevada - Tropicana Interchange on Interstate 15 looking North-east toward downtown Las Vegas. Old U.S. 91 is parallel to Interstate 15."
<u>Top Right</u>: caption: "New York - I-81 Syracuse."
<u>Left</u>: caption: "New York - Onondaga Interchange, I-81 and I-690 – Syracuse." 22



Above: caption: "Oregon - An expensive and difficult project is the construction of the Stadium Freeway (I-405) through metropolitan west-side Portland. Work is well advanced with some of the over crossing already opened to traffic."

Left: caption: "Oregon- The Stadium Freeway, I-405, in Portland is currently under construction. The 5th Street freeway on-ramp is in lower half of the photograph. The freeway when completed, will bypass downtown Portland on the west."



<u>Above</u>: caption: "Pennsylvania - The Crosstown Boulevard, a connector freeway skirting the cast edge of Pittsburgh's 'Golden Triangle,' was being built with Federal-aid urban funds. This Pennsylvania Project was coordinated with urban renewal re-development programs."

<u>Left</u>: caption: "Pennsylvania - Pittsburgh, I-79 still under construction, the Crosstown Boulevard penetrates the east end of the Golden Triangle. Completion of this facility will provide the triangle with express access on all three sides. Dome at left is a unique Public Auditorium with a retractable roof."

<u>Top Left</u>: caption: "Texas - The Capitol Avenue interchange on Interstate Route 45, adjacent to downtown Houston. (The viaduct at the left was not yet open to traffic)."

<u>Top Right</u>: caption: "Texas - The towers of Houston rise over the North Freeway (I-45), presenting travelers with a stunning urban panorama."

<u>Left</u>: caption: "Texas - The final section of the complex Thornton Freeway skirts downtown Dallas."

<u>Above</u>: caption: "Washington - The reversible center roadway (not yet in use) of the Seattle Freeway, part of Interstate 5, will meet the alternating-direction peak demand of morning and evening rush-hour traffic."

<u>Left</u>: caption: "Washington - Interstate 5 is pictured as it winds through the central business district of Seattle, queen city of the Northwest. Opening of this freeway by the end of 1966 is expected to place approximately three million people within two hours of downtown Seattle. According to Director of Highways, Charles G. Prahl, this project will serve more people than any other transportation in complete cooperation with engineers and officials of the U.S. BPR."

Top Left: caption: "Washington - Seattle- area motorist lost little time in getting acquainted with the Seattle Freeway. This photo, taken shortly after the ribbon-cutting ceremony, shows the prompt changeover of traffic to the new and safer highway. The view is toward the south from the Yesler Way under-crossing bridge."

Top Right: caption: "Seattle, Washington - tri-level section of I-5 near Lakeview Boulevard. Space Needle towers above city's skyline."

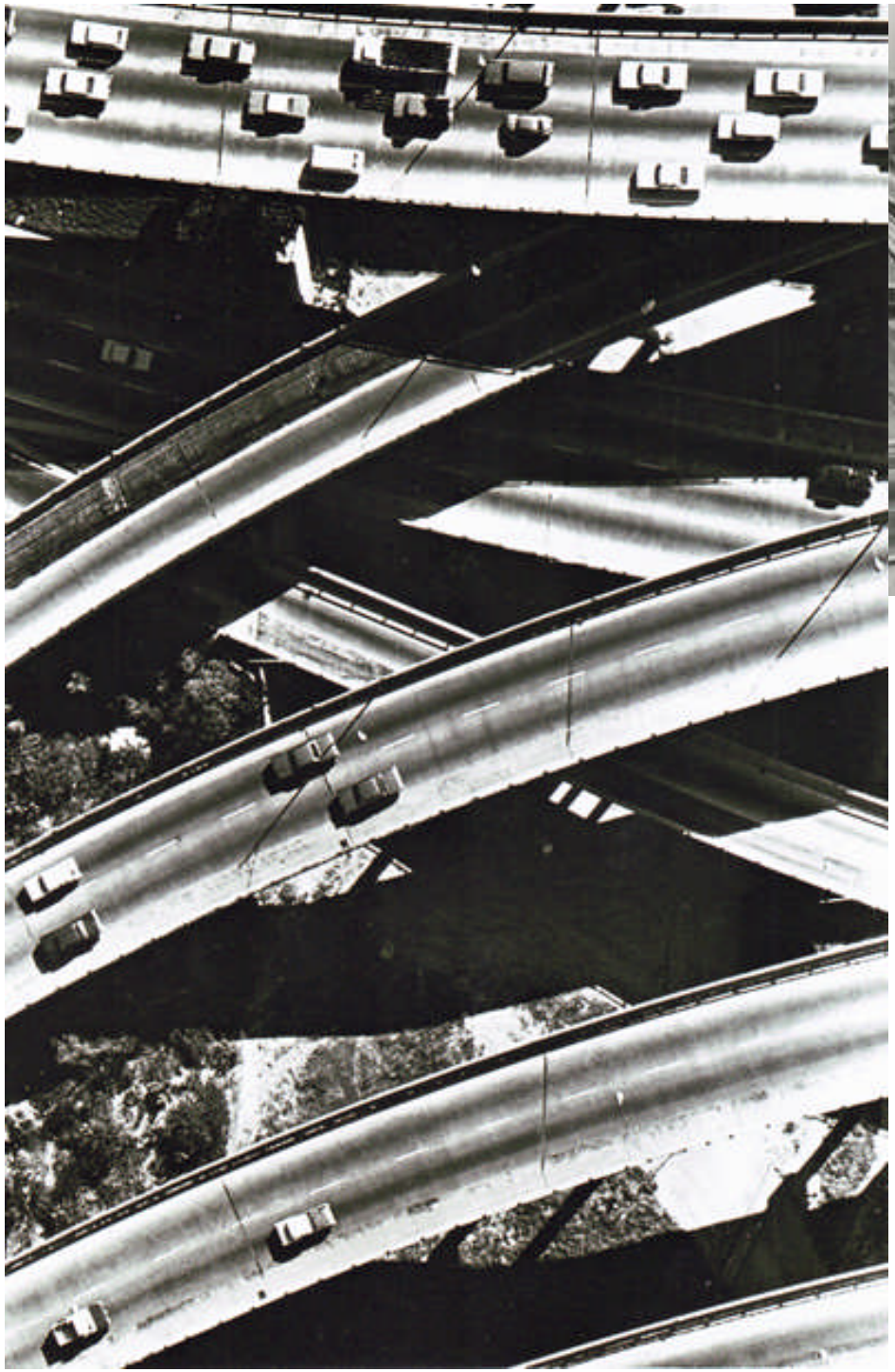
Left: caption: "Work on this section of Interstate Routes 15 and 80, leading into Salt Lake City, Utah, from the north, began in 1958. The elevated roadways leading off to the left are spur routes to the central city."

2) It Will Reduce Traffic Jams

"…The nation's biggest jams are caused today by people going to or from work. The Bureau of Public Roads in 1955 surveyed the nation for the heaviest traffic, and came up with these examples: At a focal point on the Hollywood freeway, near Los Angeles: 290,760 vehicles were counted on its busiest day, July 18; 172,000 on an average day. The greatest movement of vehicles at any single point in the world. On Lake Shore Drive near Aldine St., Chicago: 142,503 vehicles on June 13. On Highway Bridge, which carries U.S. 1 south from Washington D.C.: 117,333 vehicles on a Friday in July. These figures are so large that they don't give you a clear idea of the traffic involved. On an ordinary two-lane road, when traffic goes up to 4,000 vehicles a day, it's time to add lanes. Accordingly, there will be many lanes in the Interstate. Twenty-three hundred miles of it through open country will be six lanes or more. Similarly, the 6,700 miles leading into cities will be, in many cases, six or eight lanes…"

***Popular Science,* May 1956**

3) It Will make Possible Longer Vacation Trips



"…The Interstate will be constructed either by widening and improving highways that exist, or by laying down new freeways parallel to today's roads. Florida, a state that wants to be reached badly by vacationists, has jumped the gun and is right now improving its section of U.S. 1 into a four-lane freeway that will be part of the interstate. All other parts of the nation will also be easy to reach when the Interstate is completed. Besides that, it will connect with the Inter-American Highway at Laredo, Tex., and at the Canadian border with roads to the Alaska Highway…"

***Popular Science,* May 1956**

<u>Above</u>: caption: "California - A section of the 23-mile freeway loop formed by the junction of the Santa Monica and Golden State Freeways (Interstate Routes 10 and 5) in Los Angeles."

<u>Left</u>: caption: "California- Interchange of Golden State Freeway (I-5) and Santa Monica Freeway, (I-10)."

<u>Top Left</u>: caption: "Florida - Completed 36th Street interchange on the Miami Expressway, Miami, Florida."

<u>Top Right</u>: caption: "Florida - I-4 (Section 75280-3417) in Orange County - America to Washington Street in Orlando showing Municipal Parking Area under the large structure on the recently opened project. 7-19-62."

<u>Left</u>: caption: "I-95 in Brevard County shows the wooded median and roadside areas preserved by the Florida Department of Transportation. The tall cypress tree in the median area is the nesting site for a family of ospreys."

4) It Will Provide Satisfactory Speed With Safety

"…Roadways in each direction will be separated from each other. Division strips will be from four to 12-feet wide (in some cities and narrow mountain passes) to 40-feet (country) – or wider. In some places, the roadways in each direction will be so far apart that, driving on one, you won't see the other one. You may be driving west on a mountain, while the eastbound lane is in the valley below. This will make parts of the Interstate the first cross-country highways to be one-way. There will be no sharp grades on the whole Interstate network – not even where you cross the Rockies at the California, Oregon or Washington state lines. The many lanes will make possible the easy passing of cars ahead of you. The easy passing, in turn, will eliminate long queues of traffic – and nervous irritation. The hazard of monotony felt by drivers on long, straight roads will be reduced by some slight winding or curvature, but not by a whole lot of curves to make the highway snaky across a Kansas prairie…"

***Popular Science,* May 1956**

<u>Left</u>: caption: "California - A four-lane divided freeway (I-5) together with frontage roads, ramps and connections graded and surfaced with concrete pavement on cement treated subgrade."

<u>Top Left</u>: caption: "California - Freeway construction on Interstate 80 in the Sierra Nevada features opposing lanes on independent vertical and horizontal alignments with a widely varying median width to conform to the terrain and to provide adequate room for snow throw."

<u>Top Right</u>: "Massachusetts - Massachusetts Turnpike looking west showing variable guard rail in median, and two-level sections."

<u>Left</u>: caption: "This segment of I-97 between Baltimore and Annapolis opened in December 1987."

<u>Left</u>: caption: "This section of Interstate highway (I-95 in Virginia) illustrates many of the safety features being built into the Interstate System, which will result in saving 8,000 lives each year when the system is complete. These features include: controlled access, wide median dividing opposing traffic, long sight distances, gentle curvatures, all crossings separated by bridges or underpasses, wide paved shoulders, and acceleration and deceleration lanes. Note also good design integrating esthetics and safety, including retention of trees in median and interchange area to reduce headlight glare, and adaptation of all highway elements to geographical features."

Interstate vs. Toll Roads

"… As on today's superhighways – like the Ohio and New Jersey Turnpikes, and the New York Thruway – which it will closely resemble, the Interstate system will have limited access. This means that garages, drive-in stands, stores and all the rest cannot spring up along it and clog traffic, as they have in the past…The Interstate will not, for many years at least, compete with today's toll roads. That's because the states, which will build the system, will not lay down new free roads parallel to toll highways until bonds of the toll roads are redeemed. In some cases, however, proposed toll roads may be built as Interstate free highways – if more federal money is available than was the case before…"

***Popular Science,* May 1956**

<u>Left</u>: caption: "California Rest area near Artois, Glenn County, I-5, looking north."

<u>Right</u>: caption: "Colorado - Natural Fort safety rest area on Interstate 25 just south of the Wyoming State line."

Top Left: caption: "Idaho - FAI Route I-15 through the large lava field looking north some 6 miles north of the city of Blackfoot. This picture was taken in June 1965 to show the construction of the rest area facilities. It shows the access roads to the proposed areas."

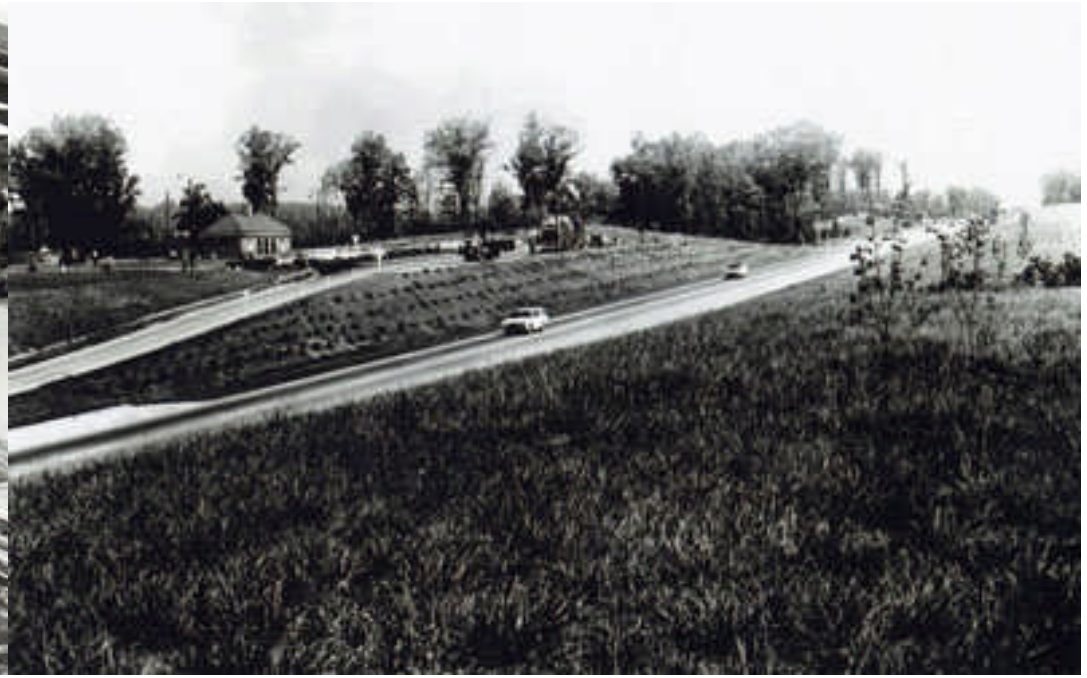
Top Right: caption: "Idaho - Rest area on FAI Route I-80N (now I-84) at the Idaho-Oregon State line. This rest area is on the Idaho side overlooking the Snake River and the highly developed agricultural land on the Oregon side. The area provides tables, toilets, shade, lighting, grass, and running water. Trees have been planted. Looking northwest in June 1967."

Left: caption: "Kansas - Safety rest area located on Interstate 70 in Geary County. Native timber lends maturity to the rest area; picnic facilities are available."

<u>Above</u>: caption: "Oregon - The State tree of each of the States is planted in the Grove of the States. The grove is located in the Baldock Safety Area on I-5, approximately 20 miles south of Portland."

<u>Left</u>: caption: "Oregon - Recently completed Baldock Safety Rest Area south of Portland, about a half-mile south of the Hubbard Interchange just south of Wilsonville on I-5."

<u>Top Left</u>: caption: "The twin Tiger Mountain safety rest areas on Interstate Route 40 in Okmulgee County, Okla., offer pleasant respite to motorists."
<u>Top Right</u>: caption: "New Mexico - Roadside rest area along interstate 40 approximately 20 miles east of Gallup."
<u>Left</u>: caption: "Oregon - The Suncrest Safety Rest Area is located adjacent to the southbound travel lanes of I-5, about five miles northwest of Ashland."



<u>Left</u>: caption: "Oregon - The Safety Rest Area program in Oregon has proved to be most popular with the motoring public. Originally planned to provide for 12 percent of the average daily traffic some of the areas are now servicing as high as 18 percent of the ADT by their sites. This aerial photograph shows the Santiam Safety Rest Area located on I-5 approximately mid-way between Salem and Albany."

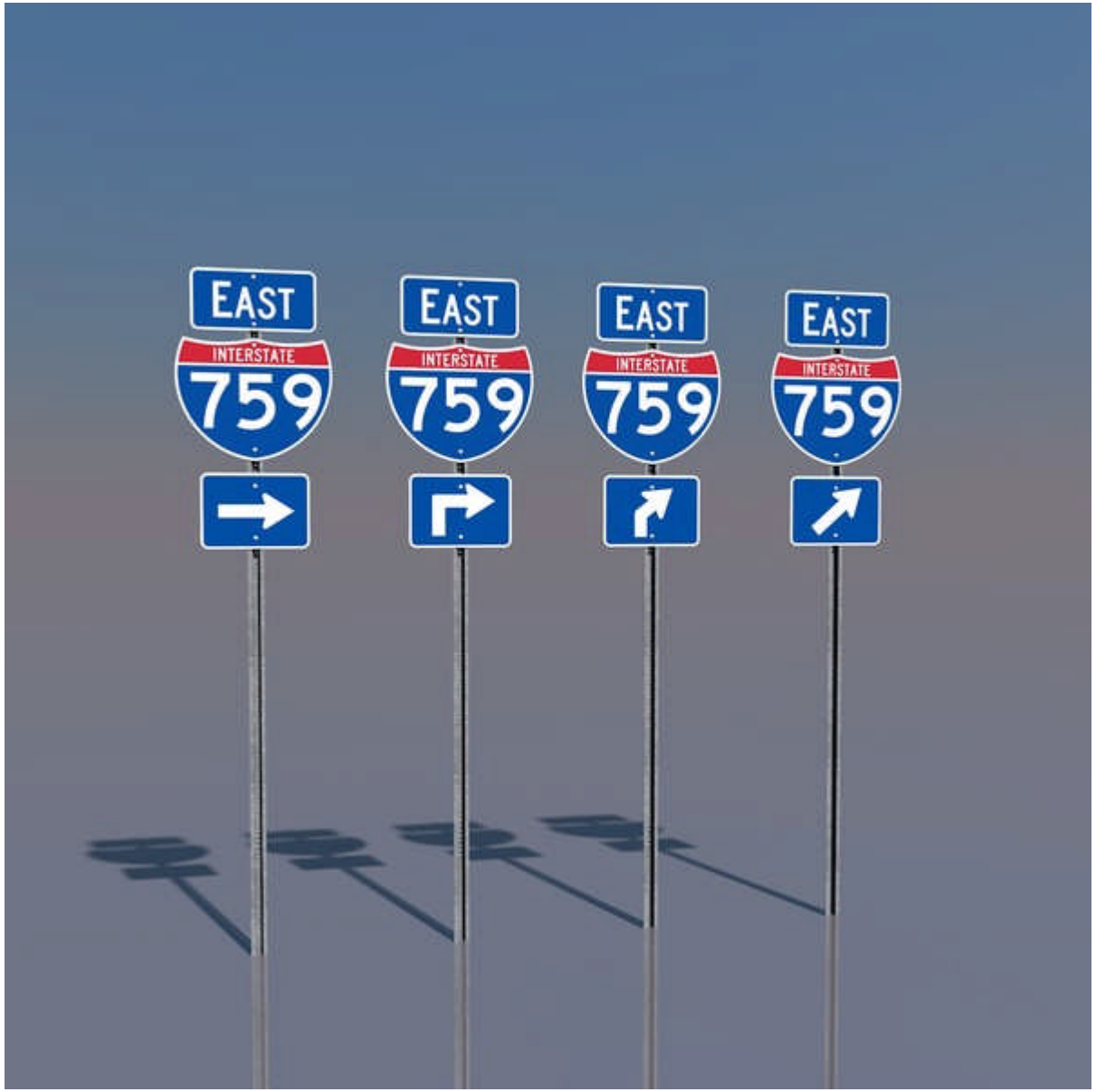
<u>Right</u>: caption: "Virginia - Dumfries rest area, Route 95, Prince William County."


REST AREA
KEEP RIGHT

Distinctly Different

"…The Interstate, which will include parts of many U.S. highways, will have its own distinctive markings. This will be determined by the American Association of State Highway Officials. All of the features of the Interstate mean that upon it you'll be able to maintain, with no stops and few slowdowns, About 60 m.p.h. all day. Speed limits, as now, will be set by states…"

***Popular Science,* May 1956**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Eighth Wonder

"…Last year, the American Society of Civil Engineers picked the seven Modern Civil Engineering Wonders of the U.S.: The Chicago Sewage Disposal System (which included reversing the Chicago River), the Colorado River Aqueduct (which brought water to six million people), the Empire State Building, the Grand Coulee Dam, Hoover Dam, the San Francisco-Oakland Bay Bridge, and the Panama Canal (built by the U.S.). The interstate system will make all of these look like something a small boy put together out of building blocks. For one thing, it will cost $27 billion dollars. That's more than the tax assessor thinks every single building, home and scrap of real estate in all of New York City is worth. The Panama Canal, greatest earth-moving project of its time, cost only $633 million…"

***Popular Science,* May 1956**

Mankind’s Biggest Building Job

"…For one thing, construction of the Interstate will set off the biggest bridge-building spree the U.S. has ever been on. Thousands must be built, repaired or strengthened. Most will be small. But the proposed world's largest suspension bridge – over the Narrows, New York City's harbor entrance – may be erected as part of the Interstate…"

***Popular Science,* May 1956**

Left: typical overpass bridge on an Interstate highway

Right: *Verrazano-Narrows Bridge* under construction (ca. 1963)

<u>Top Left</u>: caption: "Connecticut - Interstate Route 91 - Founders Bridge interchange in Hartford. Aerial view looking northeast. Nov. 26, 1958."

<u>Top Right</u>: caption: "Curved girder bridge in Farmington over I-84."

<u>Left</u>: caption: "Connecticut - A steel-arch design was chosen for esthetic reasons for this bridge spanning Interstate Route 84 in Middlebury."

<u>Top Left</u>: caption: "California - Interstate 80 at Carquinez Straits with new bridge in foreground and the 8 million yard benched cut at left center beyond the Crockett interchange. Old U.S. 40 can be seen at the right. January 29, 1959."

<u>Top Right</u>: caption: "California - The MacArthur Freeway (Intestate 580) was opened to traffic from the distribution structure near the San Francisco-Oakland Bay Bridge to Grand Avenue in Oakland last May. (1963)"

<u>Left</u>: caption: "I-80, Donner Pass"

<u>Above</u>: caption: "Eugene A. Doran Bridge over San Mateo Creek on I-20, Junipero Serra Freeway, was designed with a narrow sight-lined span with delicately fashioned."

<u>Left</u>: caption: "View of I-70 through Glenwood Canyon, Colorado."

<u>Top Left</u>: caption: "California Department of Public Works takes five first places in a nationwide highway beauty contest sponsored by the Federal Highway Administration. Shown above is the winner of the bridge, ramp, overpass, interchange area or tunnel approach category. It is the Cabrillo Freeway bridge at the Interstate 280 interchange in the San Francisco area."

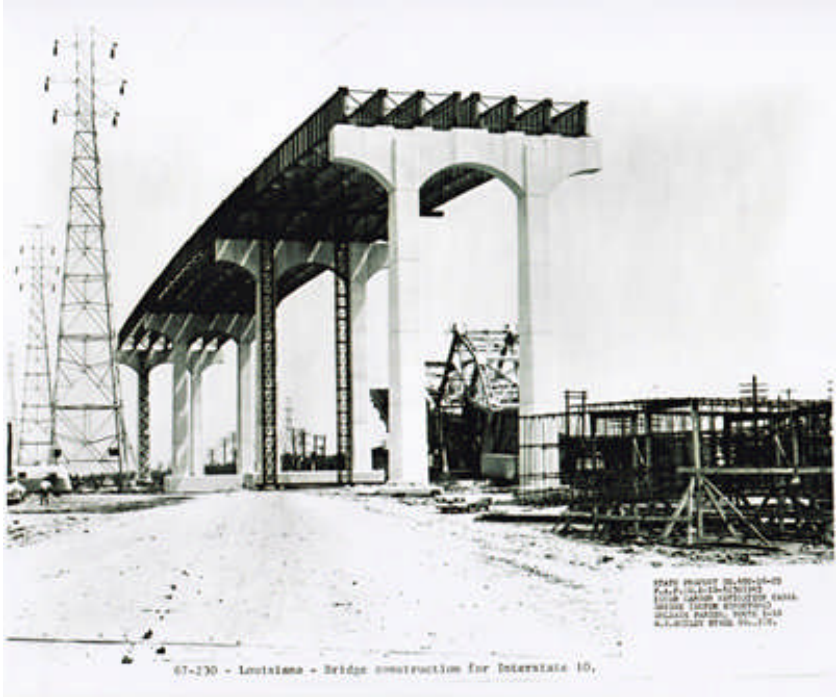
<u>Top Right</u>: caption: "Category 3 - 2nd place, I-15 Escondido, California"

<u>Left</u>: caption: "I-75 at Chattahoochee River (north of Atlanta)"

<u>Top Left</u>: caption: "I-80 LeClaire bridge over the Mississippi River at LeClaire, Iowa."

<u>Top Right</u>: caption: "Wisconsin - Interstate Route 90 crosses the Rock River on twin bridges and intersects State Route 59 near Edgerton on its way from Chicago to Wisconsin Dells."

<u>Left</u>: caption: "A forest of steel takes shape as twin bridges and approaches to carry Interstate Route 80 over the Des Plaines River at Joliet. A main center span is seen here mounted on barges, ready to be floated into place."



<u>Top Left</u>: caption: "Kansas - Interstate Route 70 links the two Kansas Cities, crossing the Kansas River on the old and new Intercity Viaducts. (The new structure was carrying all traffic while the old one was being re-decked). The Kansas City, Mo., central business district, looming in the distance above, is shown close up below, served by the Innerloop section of I-70. (construction was underway at the time of this photograph.)"

<u>Top Right</u>: caption: "Kentucky - I-75 Clays Ferry Bridge, Madison County- Fayette County."

<u>Left</u>: caption: "230 - Louisiana – Bridge construction for Interstate 10."

<u>Top Left</u>: caption: "Louisiana - Bridge construction for Interstate 10."

<u>Top Right</u>: caption: "Louisiana - Lake Charles bypass bridge over Calcasieu Lake and River - I-210."

<u>Left</u>: caption: "Massachusetts - Merrick River Bridge on Interstate 95 North of Boston."

<u>Top Left</u>: caption: "Maine - Twin Interstate bridges on I-95 across the Penobscot River at Medway. These structures opened to traffic in the Fall of 1966."

<u>Top Right</u>: caption: "Minnesota - Duluth-Superior bridge looking toward Wisconsin on Interstate route 535."

<u>Left</u>: caption: "North Dakota - Looking westerly on Interstate 94 showing the West Medora Interchange nearing completion, the Little Missouri River Bridge, and present travel on U.S. highway 10. The interchange shown will be the west terminus of Interstate 94 until the next portion west to the Montana State Line is completed."

<u>Top Left</u>: caption: "New-Hampshire Artist's rendering of the proposed I-95 bridge over the Piscataqua River between Portsmouth, N.H. and Kittery, Maine."

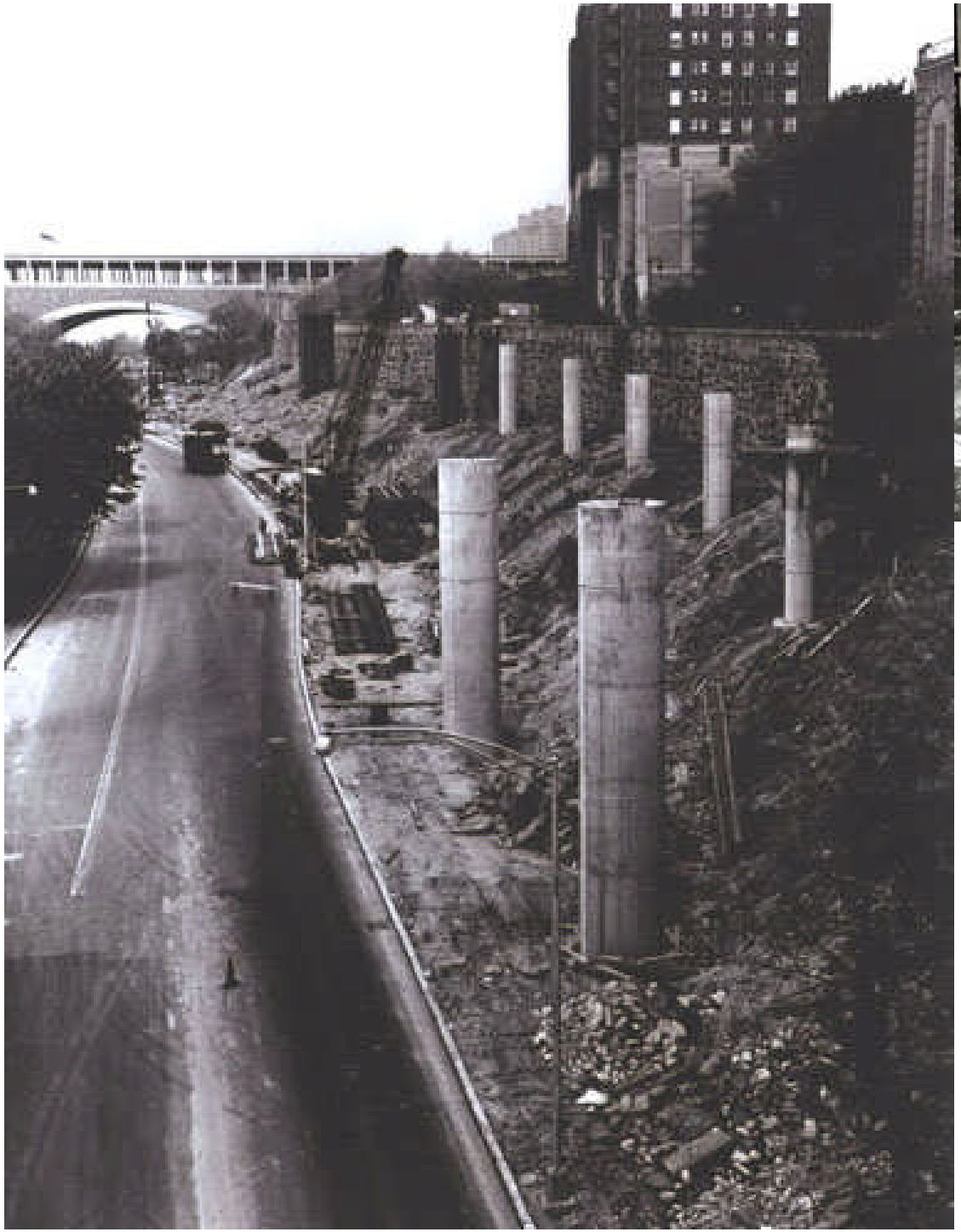
<u>Top Right</u>: caption: "New Hampshire Artist's rendering of the proposed $3 million Amoskeag Bridge in Manchester. Twin deck girder bridges across the Merrick River at Amoskeag. Actual construction on the Federal-aid urban project is not planned to start before the spring of 1968, with final completion due in the fall of 1969. The above view of the 800-foot long twin structures depicts the N.H. Insurance Group home office and the State Armory in the center and right-hand background, along with proposed roadway ramps to Elm Street, Canal Street and River Road."

<u>Left</u>: caption: "Nebraska - The new Missouri River Bridge, I-480, between Omaha (above) and Council Bluffs."

<u>Top Left</u>: caption: "New Hampshire - Interstate 89 spans the Connecticut River between Vermont and New Hampshire. Looking Northwesterly toward 'Twin State Crossroads' of Interstate Routes 91 and 89 at White River Junction in Vermont."

<u>Top Right</u>: caption: "New Hampshire- Interstate 89 crossing the Connecticut River near Lebanon."

<u>Left: caption</u>: "The Ash Street bridge over Interstate Route 93 in Londonderry, N.H., was a prize-winning entry in a bridge design competition."



<u>Above</u>: caption: "New York- Looking north at new ramp to Henry Hudson Parkway. Second deck Construction."

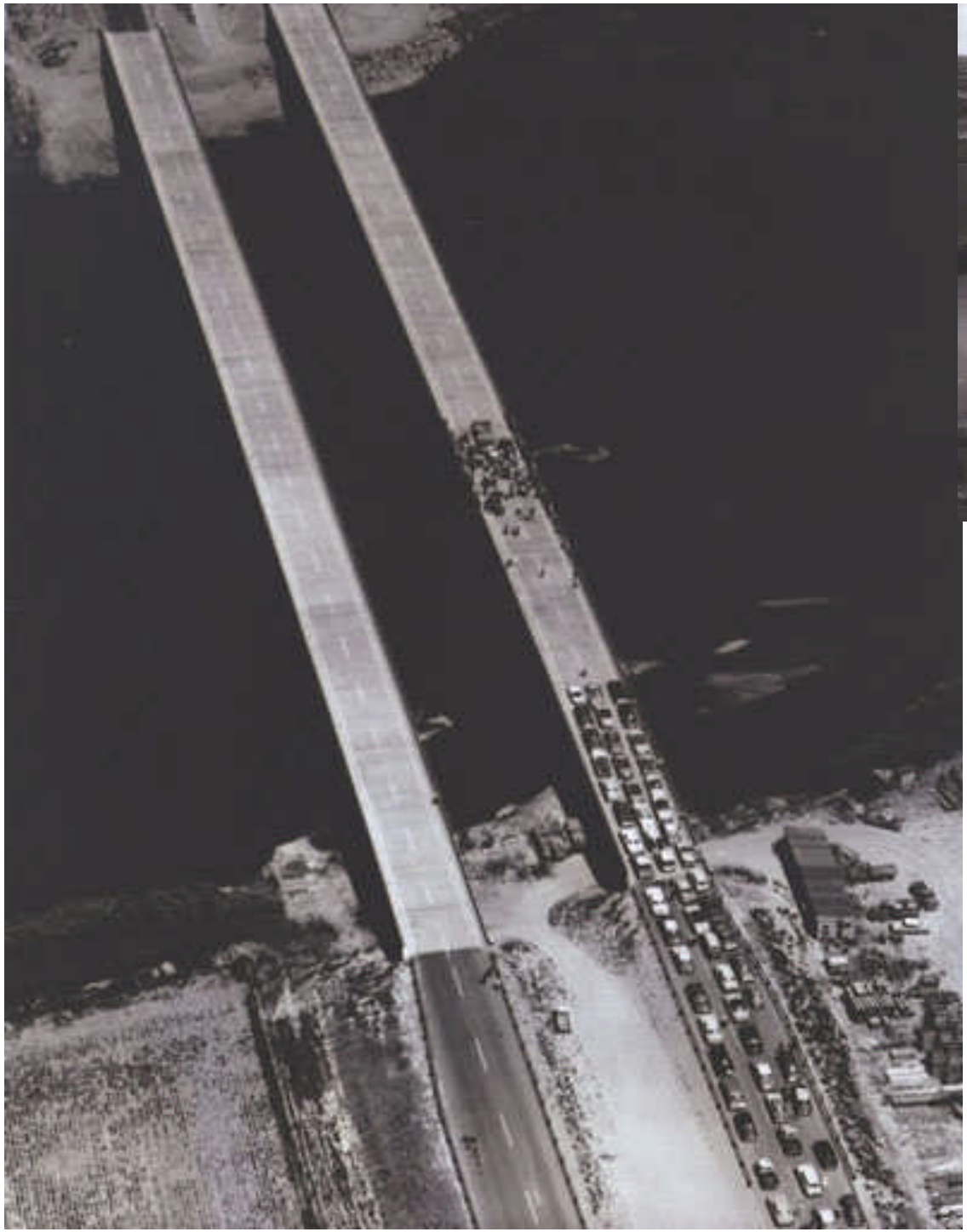
<u>Left</u>: "New York - George Washington Bridge. Second deck construction."

<u>Above & Left</u>: caption: "New York - George Washington Bridge approaches with Alexander Hamilton Bridge foreground. View looking west."

<u>Top Left</u>; caption: "New York - The Trans-Manhattan Expressway crossing the island of Manhattan. This is the most outstanding example of utilization of air rights in the country. Four 32 story apartment buildings and the Port of New York Authority Bus Terminal are shown spanning the twelve lane freeway."

<u>Top Right</u>: caption: "New York - Verrazano-Narrows Bridge between New York City and Staten Island is the largest suspension bridge in the world. Total length of bridge is 13,700 ft; length of suspended structure, 6,690 ft; main span, 4,260 ft; each side span, 1,215 ft; width, 103 ft. The main towers reach 690 ft above the mean high water and the clearance at center is 228 ft above the mean high water. On two decks with roadways of 74 ft in width, twelve lanes of traffic will carry vehicles across the Narrows."

<u>Left</u>: "New Mexico - Utilities bridge spanning Interstate 40 on the west side of Albuquerque."



<u>Above</u>: caption: "Idaho-Oregon - Looking south at the State line bridges over the Snake River one mile southeast of Ontario. Concrete surface, 30 foot curb on each bridge. Length of bridge is 986 feet, spans 127 feet. Bridge designed and constructed by Oregon State Highway Department. Each State paid one-half the cost."

<u>Left</u>: caption: "Idaho-Oregon - Ribbon cutting day at State line bridges one mile southeast of Ontario, on Snake River. The bridges were opened to traffic in January 1960."

<u>Top Left</u>: caption: "Ohio- Interstate Route 71 & 75 cross the Ohio River from Covington, Kentucky, on this two-level bridge into Cincinnati, Ohio, where ramps distribute traffic to the two diverging Interstate routes and the city Streets."

<u>Top Right</u>: caption: "Oregon - The Marquam Bridge over the Willamette River in Portland. The two-decked structure connects I-5 and the Stadium Freeway (I-405) with the East Bank Freeway, I-80N (now I-84), and the Minnesota Freeway, which runs to the Interstate Bridge (I-5 across the Columbia River)."

<u>Left</u>: caption: "Oregon- Construction continues on the Bonneville-Hood River County Line Section of I-84. The two-lane Tooth Rock Tunnel will be used for eastbound traffic; the westbound lanes will use a viaduct."

<u>Top Left</u>: caption: "Oregon - The Marquan Bridge gives motorists in the Portland area direct and easy access to the Banfield, Baldock, and Stadium Freeways. The opening of the bridge has reduced traffic congestion in this area considerably. The uncompleted section of the span in lower right corner of picture will connect to the Mr. Hood Highway (US26) in the future."

<u>Top Right</u>: caption: "Pennsylvania - Mercer County. High level welded plate girder bridge on I-79"

<u>Left</u>: caption: "Tennessee- Bridge across Tennessee River on I-24, Marion County near Nickajack Dam."

<u>Top Left</u>: caption: "The dignity of this one-half-mile long bridge carrying Interstate route 40 across the French Broad River near Dandridge, Tenn., is in keeping with its scenic setting."

<u>Top Right</u>: caption: "Virginia - New River bridges, I-81, Montgomery County."

<u>Left</u>: caption: "Interstate Route 90 slopes down from the foreground to cross an impressive structure over the Columbia River near Vantage, Wash. The old bridge at this location was removed, since it would have been submerged after completion of Wanapum Dam downstream. The public utility district which built the dam contributed $4 million toward the new bridge."

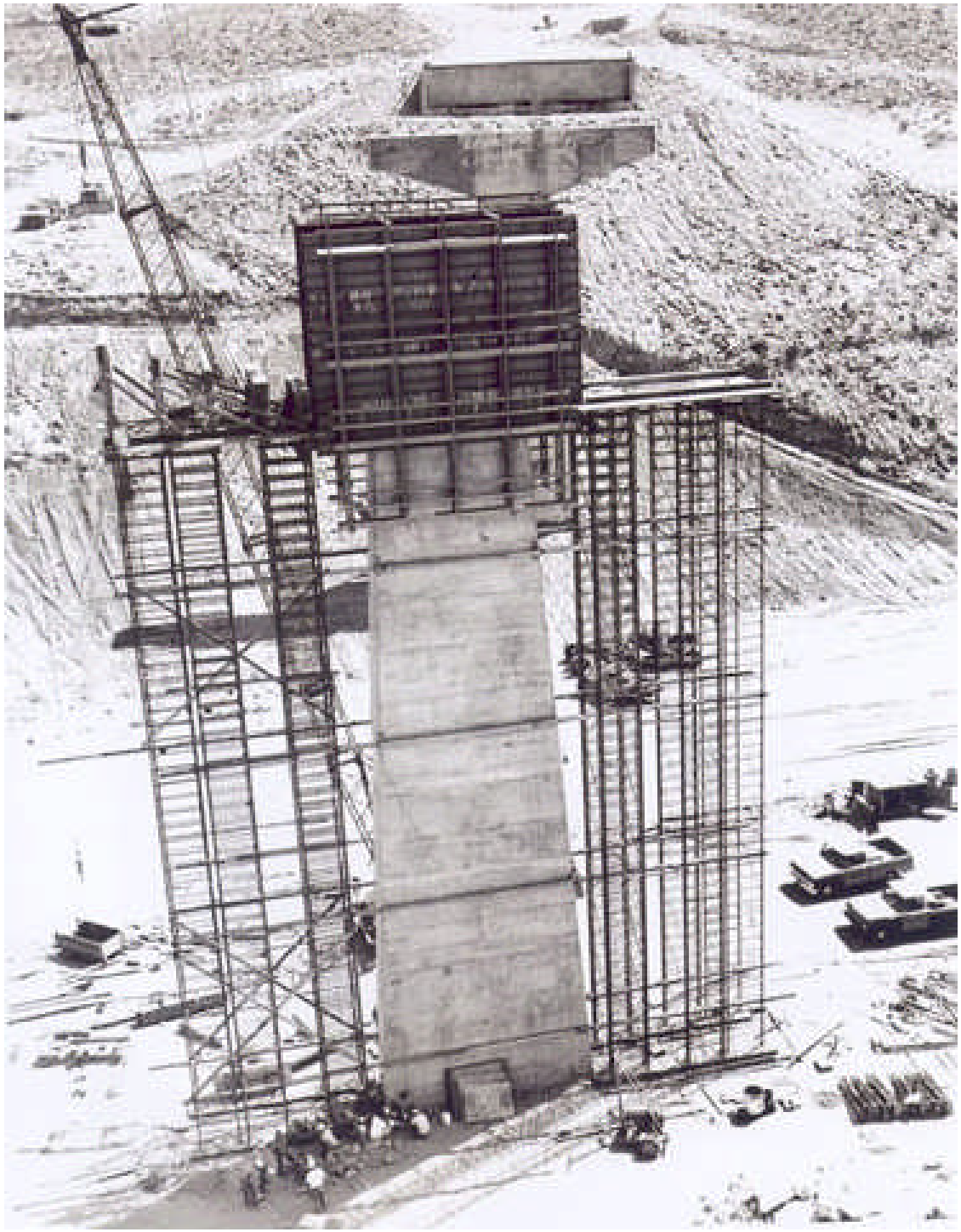
<u>Above L&R</u>: caption: "These two pairs of twin bridges on Interstate Route 90 in Wisconsin Illustrate both the functional grace and the diversity of design with which bridge builders fit structures to location needs. The girder bridges supported on piers cross the Wisconsin River; the steel arches span Mirror Lake near the Wisconsin Dells. These bridges are part of a 55-mile, $32 million section of Interstate 90 between Madison and the Dells, opened to traffic in October 1961."

<u>Left</u>: caption: "Interstate Route 90 crosses the Rock River on twin bridges and intersects State Route 59 near Edgerton, Wis., on its way from Chicago to Wisconsin Dells."

<u>Left</u>: caption: “Florida - The Sunshine Skyway Bridge, I-275, across Tampa Bay connecting St. Petersburg and Bradenton was the first bridge in the Western Hemisphere to use two single pylons holding a single plane of stays to support the span.”

<u>Right</u>: caption: “Louisiana - The I-310 Hale Boggs Memorial Bridge - built by the Louisiana Department of Transportation and Development across the Mississippi River west of New Orleans, was the first major steel cable stayed bridge in the country. When this beautiful, $135 million bridge opened in 1983, it received many honors for its design.”

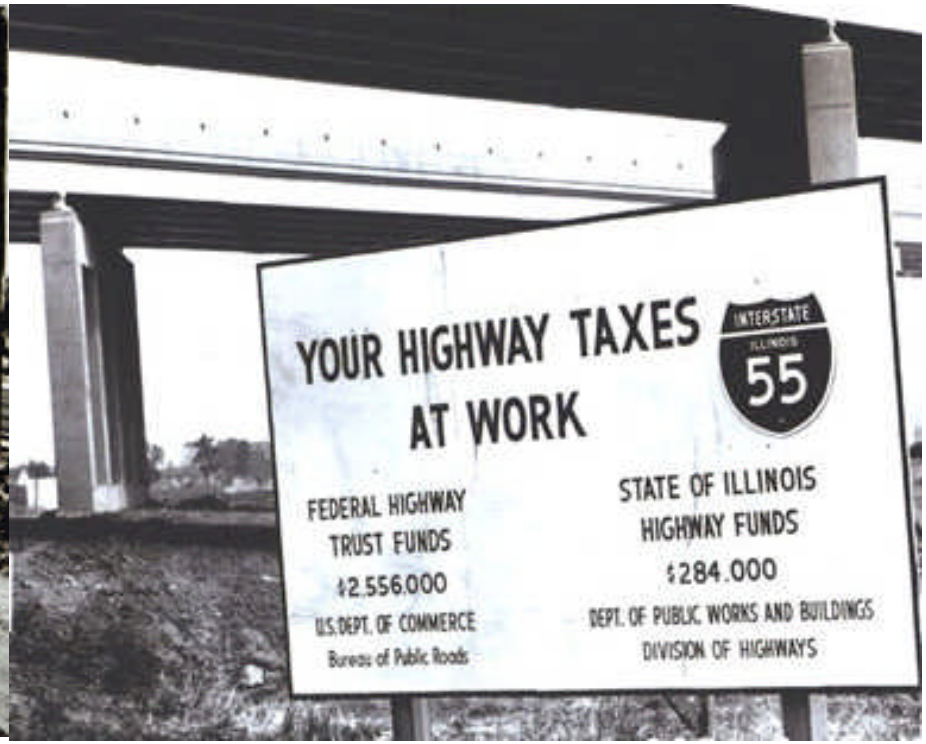
<u>Above</u>: caption: "H-3 (in Hawaii, interstate routes are numbered H-1, H-2, and H-3) was the largest construction and public works project ever undertaken by the state. H-3 connects the Kaneohe Marine Corps Air Station to the Pearl Harbor defense bases, passing through the Koolau Mountains to join the windward towns of Kailua and Kaneohe to the leeward cities of Pearl City and Honolulu. To accomplish this goal, H-3 consists of leeward and windward viaducts joined by a 1,500-meter trans-Koolau tunnel. The windward viaducts are spectacular 1.6-km long twin structures segmentally constructed, precast, prestressed, box girder viaducts. The twin 1.6 km-long leeward viaducts consist of cast-in-place, prestressed, segmental superstructures."



"…In fact, it would have been impossible for even the U.S. to have built the Interstate at the rate planned before now. Only today can we hope to get enough road engineers and enough experienced workers. For the first time, we're manufacturing enough concrete to make the job possible. And enough steel too. Although, it will still be hard to get steel as the job moves ahead. Only today we have the massive earth-moving and other road-building machinery, much of it developed during World War II and improved since. The Interstate will keep busy all the heavy equipment we have – plus all that we can possibly build new – and all our qualified manpower for 10 years. Some engineers say 15 at least (these estimates assume that Federal aid will hurry things along)…"

***Popular Science,* May 1956**

Left: caption: "Arizona - Interstate 15, Virgin River Bridge No. 7, looking east from abutment No. 1"



<u>Top Left</u>: caption: "Idaho - Project U-3281(15) on the west edge of Boise in April 1967 looking west. A twin 10'x7' concrete box culvert 452' in length is shown under construction. The cost of the project is $167,000. It includes this culvert for the Settlers Canal and two bridges over the Boise River Slough. The project is a portion of the Boise Connector to Interstate Route 80N (now I-184)."

<u>Top Left</u>: caption: "Illinois - Sign at a construction site on Interstate 55. "

<u>Left</u>: caption: "Massachusetts - Interstate 95 in Attleboro. When the Attleboro strip was being designed, a city reservoir was under construction, and the highway was planned so that its embankment would serve as a dike for the reservoir (left background), adding to the overall attractiveness of the landscape."

<u>Top Left</u>: caption: "Maine - A typical highway cross section, cut away to show thickness of pavement and base courses. The test spot was selected at random from a 25-mile newly opened stretch of I-95 between Newport and Bangor as part of an 'inspection-in-depth' made by officials of the U.S. Bureau of Public Roads and Maine State Highway Commission in November, 1963. The photo provides indisputable evidence that the tax payer is receiving full value for every highway tax dollar."

<u>Top Right</u>: caption: "Mississippi - Hinds County. Three-level separation structure."

<u>Left</u>: caption: "North Carolina - Shown here is column under construction which will support the highest bridge in North Carolina. The dual bridge is the Green River Bridge on Interstate 26 between East Flat Rock and Saluda and when finished will be 218 feet above the Green River. The longest column will be 139 feet from footing to pier cap measuring approximately 13 1/2 feet in diameter at its base and 9 feet at its top. The columns will be reinforced concrete encased in structural steel shells."

<u>Above</u>: caption: "Pouring concrete, I-90/94 (later the Dan Ryan Expressway), looking North at 60th Street, Chicago, Illinois, 9/6/62."

<u>Left</u>: caption: "A bridge across the Harpeth River under construction along Interstate 40 in Middle Tennessee."

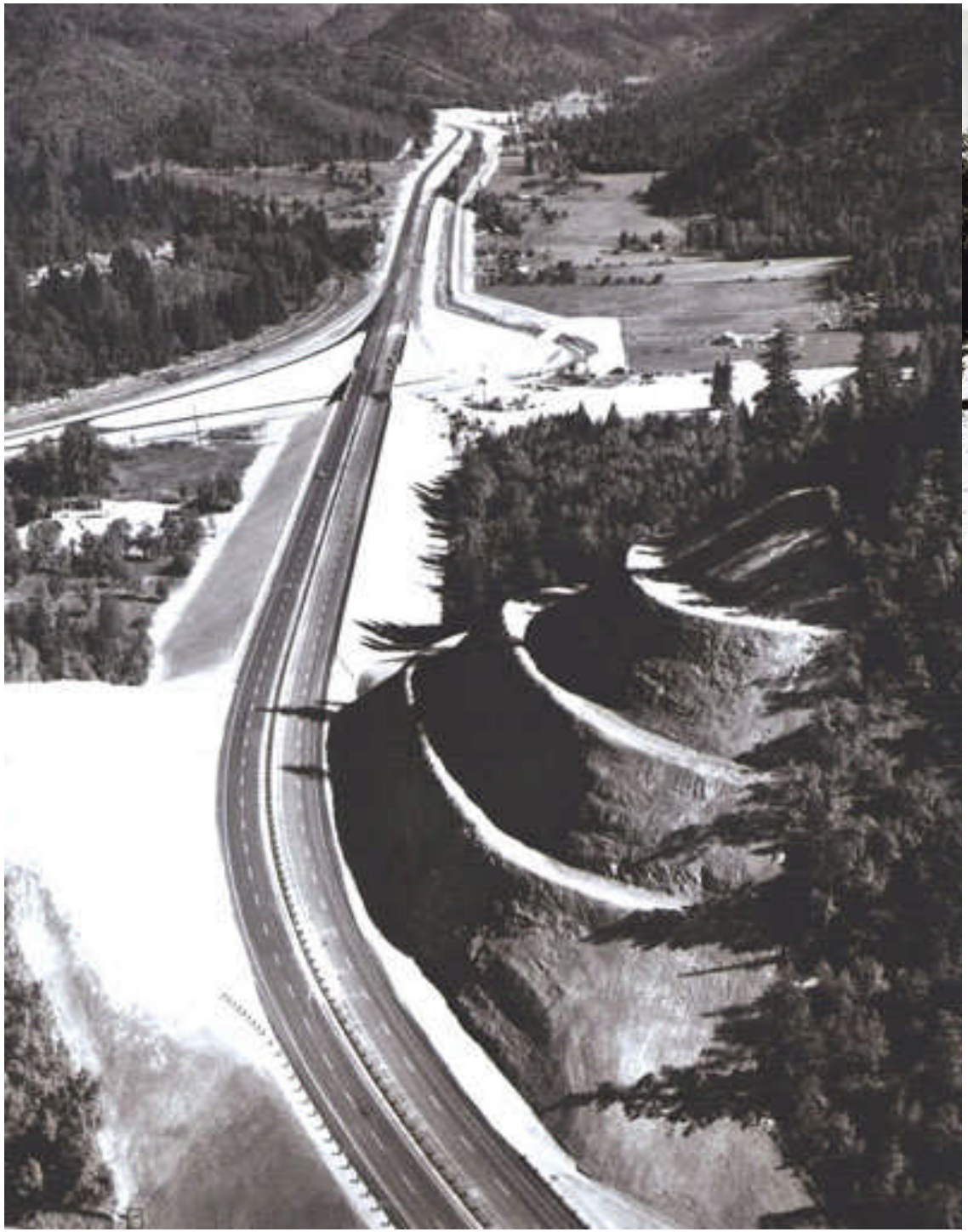
<u>Top Left</u>: caption: "New Jersey - Construction on Interstate 78 near Annandale."

<u>Top Right</u>: caption: "New Mexico - Construction underway on Interstate 40 between San Fidel and Laguna in Valencia County."

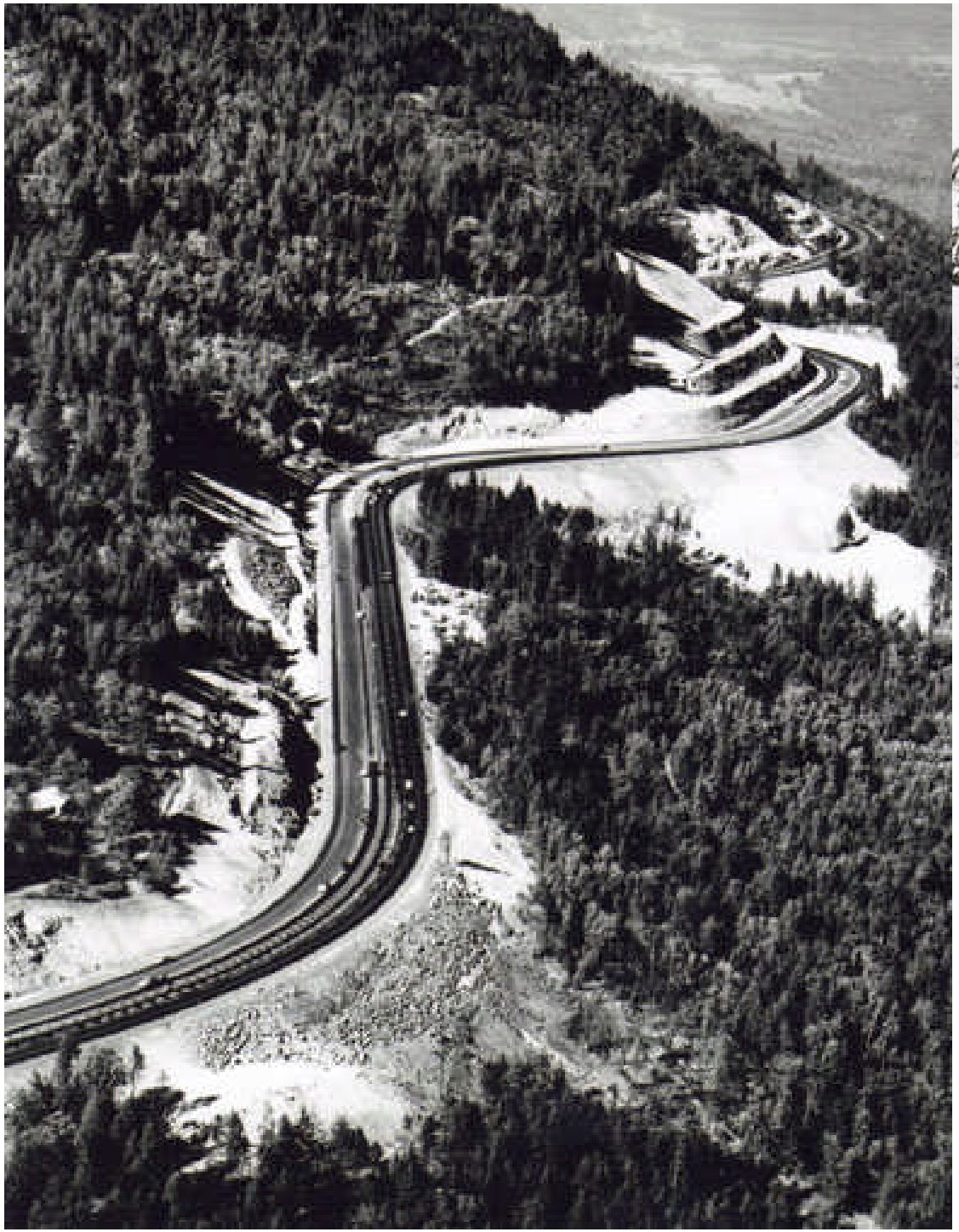
<u>Left</u>: caption: "New Mexico - Culvert installation on Interstate 25 north of the town of Truth or Consequences in Sierra County."

<u>Above</u>: caption: "New Mexico - Bridge over the Alamosa River on Interstate 25 north of the town of Truth or Consequences in Sierra County."

<u>Left</u>: caption: "Oregon - Construction underway on one of the last segments of Oregon's I-5 south of Canyonville. Shown here is the West Fore Interchange taking shape, with the two southbound lanes of the freeway in use."

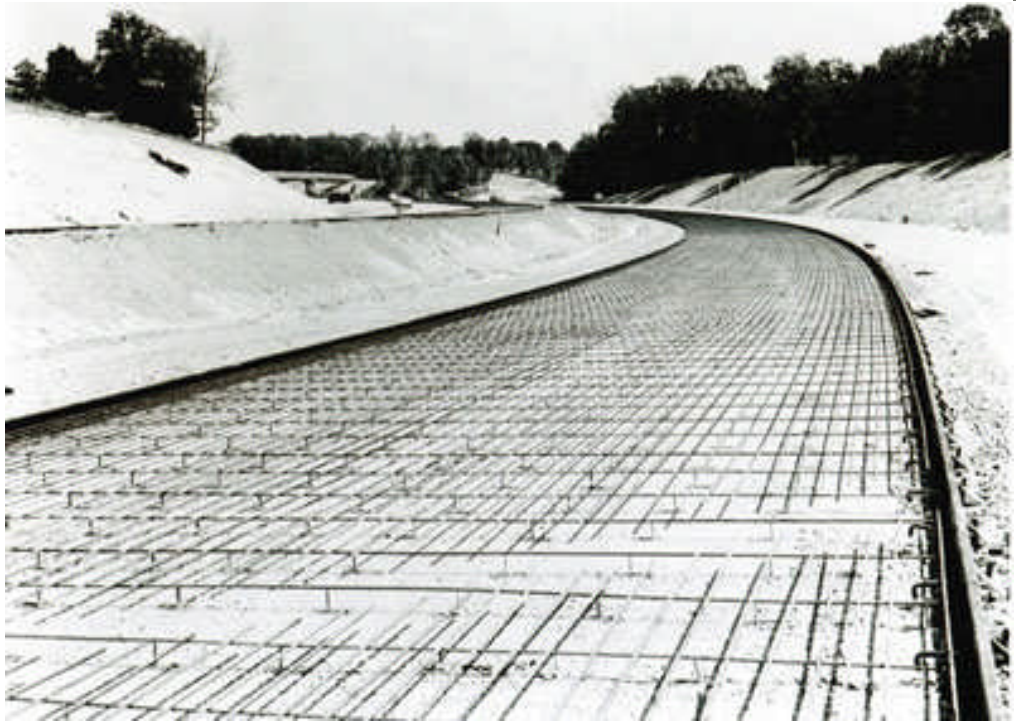


<u>Above</u>: caption: "Pennsylvania Pike County- near Milroy, I-84, first construction started."
<u>Left</u>: caption: "Oregon - The North Wolf Creek interchange, looking north, on I-5 serves the town of Wolf Creek (just out of view in the photograph) on the left. The slopes are stabilized by the benching technique, which also catches falling rock."



<u>Above</u>: caption: "Rhode Island - Washington Dual Bridge on I-195."

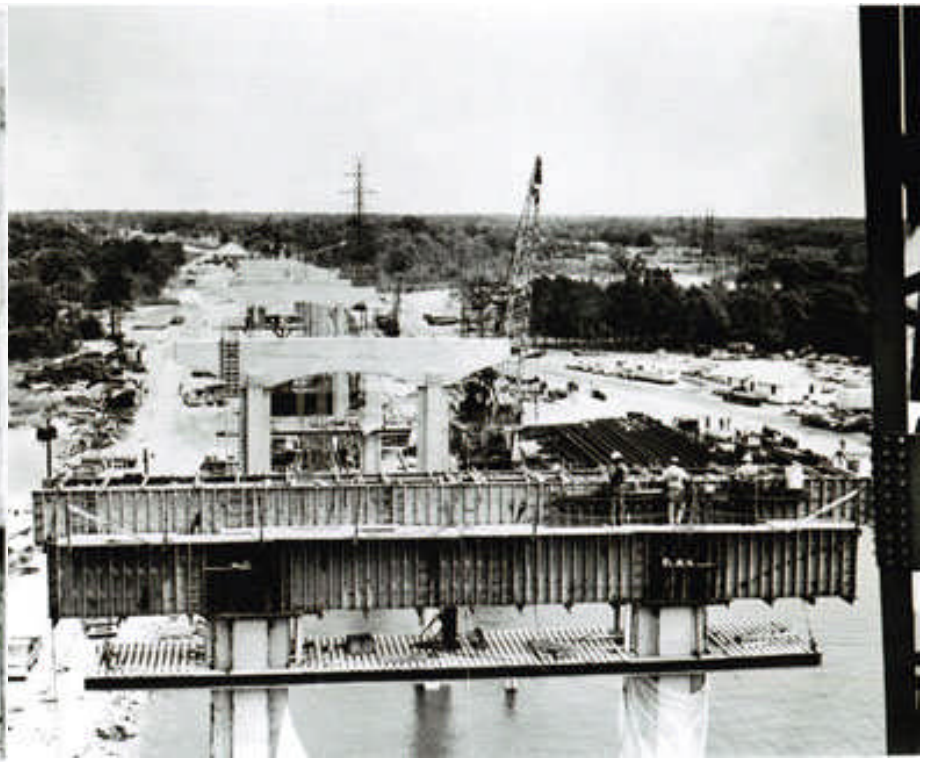
<u>Left</u>: caption: "Oregon - From Siskiyou Summit, looking north, I-5 winds its way down toward Ashland. The grade is east and the sight distance is excellent, thus combining to make a trip over the rugged Siskiyou a favorable traveling experience."



<u>Top Left</u>: caption: "Virginia - Bridge construction over southern branch of Elizabeth 1 1/2 miles south of US 460 & S.R. 166.

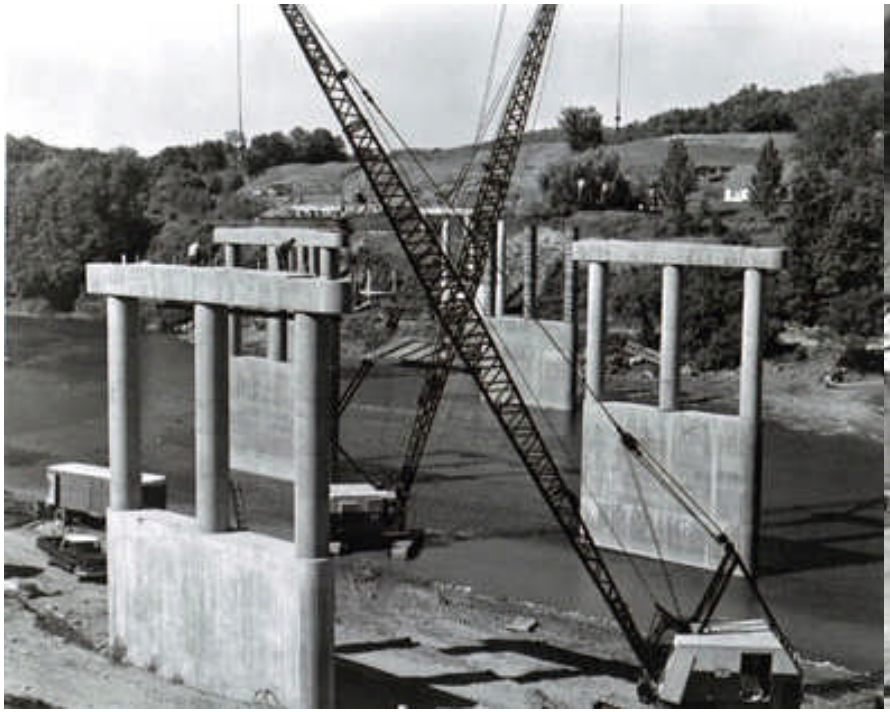
<u>Top Right</u>: caption: "Tennessee - Bridge across Tennessee River on I-24, Marion County near Nickajack Dam."

<u>Left</u>: caption: "Virginia Just east of Gaskins Road, I-64 in Henrico County."



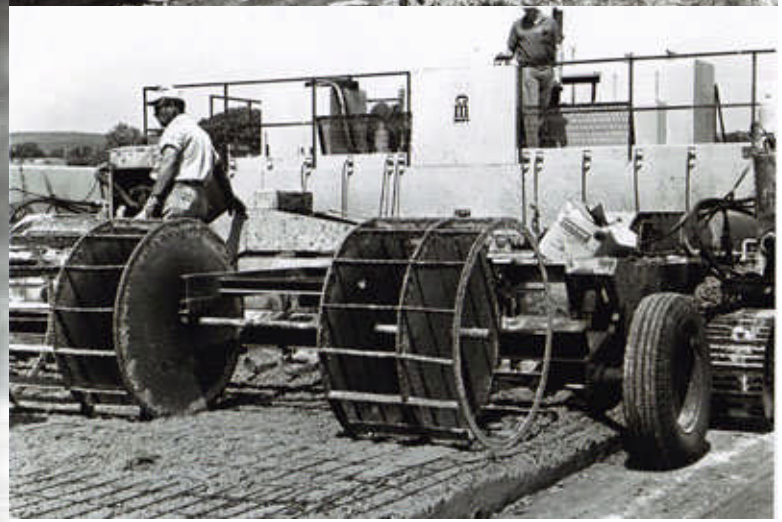
<u>Above L&R</u>: caption: "Virginia Bridge construction I-64 - in Chesapeake County, south of US 460 & S.R.166"

<u>Left</u>: caption: "Virginia Construction paving Portsmouth County - I-464 spur"



<u>Left</u>: caption: “Vermont Hartford. A 1,059’ structure spanning the White River approximately 5 miles northwesterly of White River Junction. This photograph was taken at the southerly end of the project looking north and depicts substructure construction that is currently under way. It is anticipated that this structure will be opened to traffic in the fall of 1968. This structure will be a major link in I-89 between River Junction and Montpelier.”

<u>Right</u>: caption: “Vermont-New Hampshire-These twin bridges, under construction, will carry Interstate Route 89 across the Connecticut River at White Junction. New Hampshire is building the spans over the river; Vermont is constructing the near abutment and first piers. The concrete ‘box’ in the foreground will carry a local road under the bridge approach.”



<u>Above T&B</u>: caption: "Wisconsin - Slip form concrete paving construction on Interstate 94 near Northfield between Osseo and Hixton in Jackson County."

<u>Left</u>: caption: "Washington - supports for Seattle's sect- ion of Interstate 5."

"…In full operation, the Interstate, which will total 1.2 percent of the nation's highway mileage, will carry at least 20 percent, planners think, of all miles traveled by those 100 million autos, trucks and buses the Interstate was designed for. One thing that can be predicted for certain about the future of the Interstate: we'll have to add to it."

***Popular Science,* May 1956**

<u>Left</u>: caption: "California - San Diego Freeway (I-405) - About 80,000 vehicles per day cross the Santa Monica Mountains on this freeway between San Fernando Valley and West Los Angeles. The bridge in center of the picture is Mulholland Drive over-crossing."

Deutschland Uber Alles

"…Germany stands out among all the countries of Europe in magnificent conception of a national system of major highways. This development contemplates a system of approximately 4,500 miles, of which upwards of 1,000 miles have been actually constructed. Roughly, the system contemplates three routes, north and south, and the same number east and west across the nation. This description is only approximate since the routes composing the system are designed to connect the population centers and carry traffic continuously between the borders of the nation. The construction consists essentially of two lines of roadway each approximately 30 feet in width and entirely separated from each other by a center grass strip. These roads are known as the 'Reichsautobahnen' or National Auto Roads. No cross traffic of any character is permitted. The ordinary roads are generally carried over the 'Autobahn' and separations are effected at points on intersection with railroads as best fit the design standards. No provision is made for foot traffic and no bicycle or pedestrian traffic is permitted upon these auto highways. They are designed for high speed and exclusively for the use of the motor vehicle. Here again the same principles are used in the design conceived by Germany for this system of ultra-modern through highways of providing ample width of roadways with opposing traffic separated by an unpaved strip and no cross traffic at grade to interfere with the continuous flow. The highways which have been completed are wonderful examples of the best modern road building. The road from Munich to Salzburg in Austria is one of the most delightful drives of the world…"

***T.H. MacDonald,* BPR Director (1936)**

What is widely regarded as the world's first motorway was built in *Berlin, Germany* between 1913 and 1921. The 19 km long AVUS ("Automobil-Verkehrs- und Ubungsstrabe") in southwestern Berlin was an experimental highway that was used for racing automobiles. It featured two eight-meter lanes separated by a nine-meter wide median. *Italy* built several expressways in the 1920's and Germany followed with its first *Autobahn* (auto-only road), opening in 1929 between *Dusseldorf* and *Opladen* and in 1932 between *Cologne* and *Bonn*. More routes were planned in the early 1930's. Chancellor *Adolf Hitler*, seeing the propaganda value of a high-speed road system, started a program to build two north-south and east-west links. The first of these: "Reichsautobahnen," opened on May 19th 1935, between *Frankfurt* and *Darmstadt*. Early Autobahns were crude by modern standards. The first Autobahns, like their Italian counterparts, featured limited-access and grade-separated crossings, but lacked medians. The first *Reichsautobahnen* did have narrow medians but lacked shoulders and ramps and waysides had cobblestone surfaces. When Germany was reunified in 1989, the Autobahns of *East Germany* were in virtually the same condition as they were in 1945. Inadequate signage, infrequent (and often non-functional) emergency telephones (located in the center median) and service areas consisting of a dilapidated roadhouse next to a wayside were commonplace. Newer West German Autobahns had, for many years, featured 3.75-meter wide lanes, shoulders, landscaped medians with crash barriers, frequent roadside emergency telephones and ample, well-adorned service areas.

At the end of WWII, the *Autobahn* network totaled 2,128 km. Construction on new sections finally started again in 1953 with 144 km added between 1953 and 1958, bringing the total to 2,272 km. Starting in 1959, *West Germany* began Autobahn expansion in earnest by embarking on a series of four-year plans that expanded the "Bundes-autobahnen" system to 3,076 km by 1964. Major additions continued during the next two decades and the system reached 4,110 km in 1970, 5,258 km in 1973, 6,207 km in 1976, 7,029 km in 1979 and 8,080 km in 1984. A new series of five-year plans, with the goal of putting an Autobahn entrance within 10 km of any point in West Germany, had expanded the network to over 8,800 km by 1990. However, the reunification of *Germany* in 1990 put those plans on hold as the federal government focused on absorbing and upgrading the Autobahns it inherited from *East Germany*. The incorporation of those eastern Autobahns put the total Autobahn network at almost 11K km in 1992. Additions to the unified network increased the total to 11,515 km in 2000 and 12,531 km by 2007. After reunification, the German government expedited up-grading of the old East German Autobahns in a series of "German Unity Transport Projects." By the end of 2009, the program was nearly complete with about 2,100 km of upgraded or newly-built Autobahn. Until 2000, the Autobahn was the world's second largest superhighway system after only the U.S. Interstate System. Currently, the Autobahn network is the world's fourth largest superhighway system after *China*, the *United States* and *Spain*.

Left: map of the present-day Autobahn

The general rule for design was/is to provide for unimpeded, high-speed traffic flow. Aside from unimproved older segments, most Autobahns feature the following design elements:

• Two, three, or occasionally four lanes per direction. Lanes on rural sections are generally 3.75 meters wide except the left lane of newer three lane segments – it's 3.5 meters wide. On urban sections, all lanes are 3.5 meters wide;

• A landscaped "green" median 3.5 or 4 meters wide (3 meters in urban areas). A double-sided guardrail runs down the middle. Blinders are often used on curves. Some newer sections have concrete barriers instead of green medians;

• Outside emergency shoulders and long acceleration and deceleration lanes;

• Full grade-separation and access control, generally provided by half cloverleaf interchanges at exits and full cloverleafs or directional interchanges at *Autobahn* crossings. Interchanges are generally well-spaced, sometimes exceeding 30 km between;

• Grades of 4% or less. Climbing lanes are provided on most steep grades;

• Gentle and well-banked curves;

• Freeze-resistant concrete or bituminous surface;

• Roadbed and surface typically measuring about 75 cm (30 inches) in thickness;

• Reflector guide posts at 50 meter intervals;

• Frequent parking areas, often equipped with toilet facilities;

• Extensive and ample service areas featuring fuel stations, restaurants, and hotels;

• Automated traffic and weather monitoring and electronic signs providing dynamic speed limits and/or advance warning of congestion, accidents, construction, and fog;

• Emergency telephones at 2 km intervals;

• Pre-signed detour routes to facilitate emergency closures;

• Standardized signage;

• Wildlife protection fencing, crossover tunnels and "green bridges"

"…There is more or less discussion in which the term 'super-highways' is used without any adequate definition of what is intended by this term. Perhaps, it is more frequently used in connection with a very limited number of transcontinental highways designed for high speed and with multiple-lane roadways to carry traffic from coast to coast. The German system of super-highways embodies this idea. In that country a system of about 4,500 miles of highways (which gives approximately three lines across the nation in each direction) is constructed on entirely new, wide rights of way without access from abutting lands, except at infrequent intervals. This travel section is composed of two roadways about 30 feet wide, separated by a parking (median). Both the horizontal and the vertical alignments are exceptionally good. All cross-traffic is directed over or under these highways. No detail that comes within the purview of highway engineering that will make a safer or more efficient highway has been omitted…"

***T.H. MacDonald,* BPR Director (1936)**

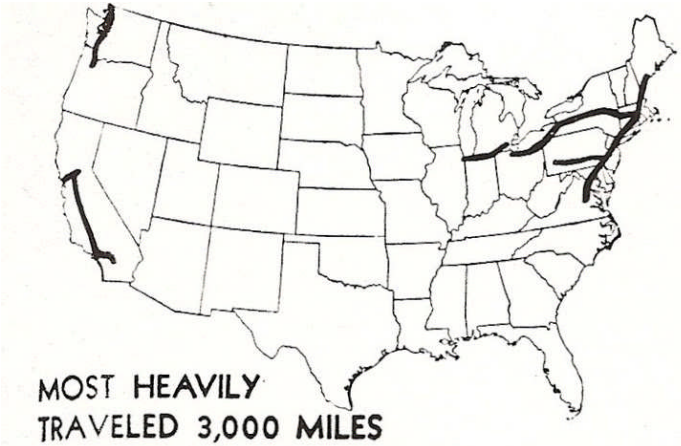
Part 2

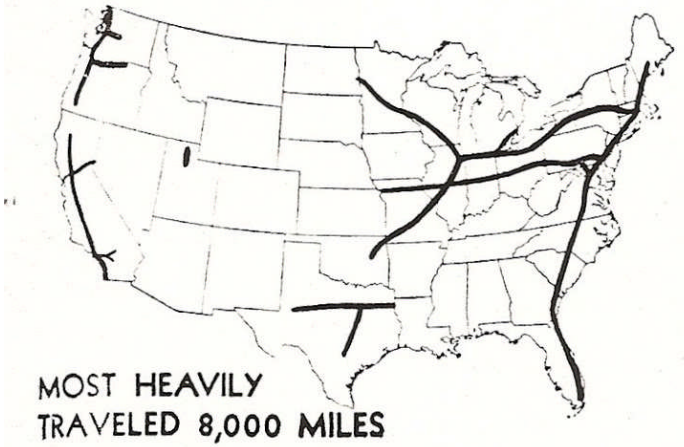
Something Must Be Done!

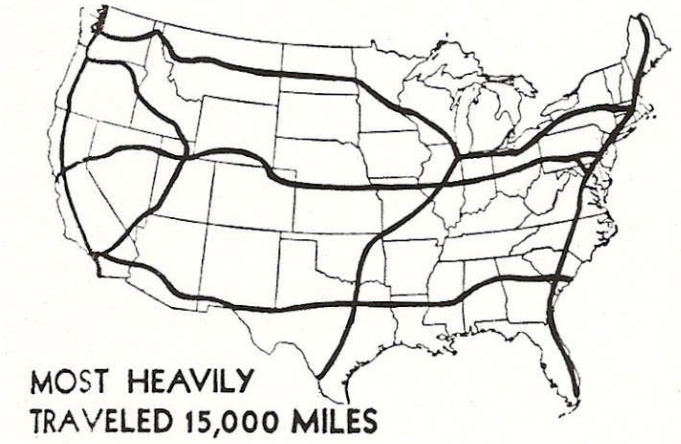
How Bad Are Our Roads?

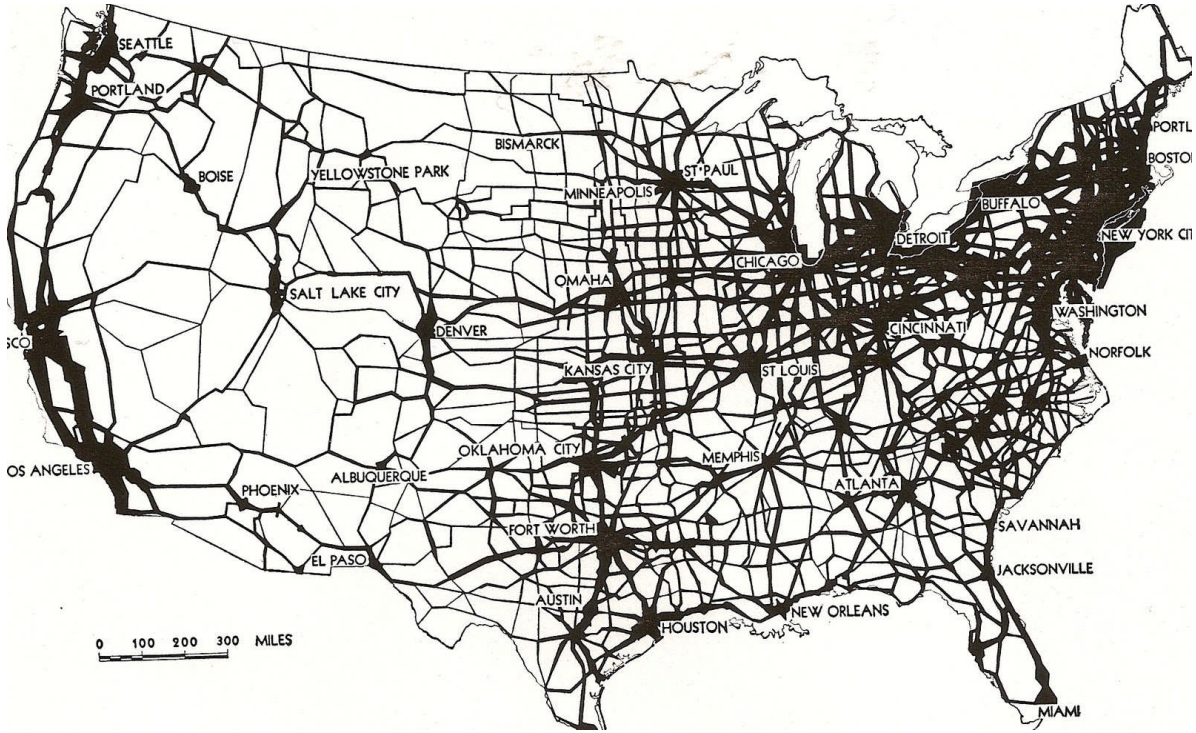
"American taxpayers have laid out 50 billion dollars for roads in the last 25 years. But we have only a trifle more than 2,200 miles of first-class, fully modern, non-toll highways to show for our money. Most of the other 740,000 miles of pavement that we have paid for since the twenties are now too narrow, too sharply curved, too steep, too nearly shoulderless, too often crisscrossed with intersecting routes and railroad tracks, or becoming too crumbly for the traffic burden they must bear. This year 52,000,000 passenger cars, trucks and buses are traveling the highways. And they are pounding those expensive pavements to pieces. Even the men whose job it is to estimate how many more vehicles are going to be on the road each successive year – and who used to be remarkably accurate – did not anticipate any such traffic before 1960. The tragic combination of an out-of-date, aging road system and this nationwide stream of traffic is costing billions a year in time lost, perishable goods wasted, property wrecked in accidents. It is causing thousands of unnecessary deaths…"

***Popular Science,* August 1952**









"Motor traffic is expected to double in the next twenty years. The radius of traffic is also growing. In the East congestion is rapidly growing to the saturation point. To break up that congestion it is necessary to open up new ways out, to decentralize, to redistribute, to create breathing space - that is the coming need. It is a need that can be met first of all by a national highway policy."

Norman Bel Geddes

RE: excerpt from his book: "Magic Motorways" (1940)

<u>Above & Left</u>: caption: "Traffic flow volume – derived from study by U.S. Bureau of Public Roads of avg. daily traffic volume" 95

"…Engineers and road officials figure it will cost us at least $4,000,000,000 a year for 15 years to bring the whole highway system up to snuff. We are now spending $2,700,000,000 a year on construction, but we are falling far short of even keeping abreast of the highway needs, to say nothing for making up for the lags in road building that set us back during the depression and the war. The most pressing problem is modernizing the 40,000 miles of highway that constitute the official interstate system – the main roads of the United States. Ninety-four percent of this network, of the greatest importance in both peace and war, is inadequate, according to standards published by the Bureau of Public Roads and all the state highway departments of the country…"

***Popular Science,* August 1952**

<u>Above</u>: caption: "National System of Interstate Highways Map (August 1947)." This 1947 map (prepared by the *Public Roads Administration*) was included in the "Yellow Book" that was given to wavering members of *Congress* who were bickering over how to pay for President Eisenhower's proposed *Interstate Highway System* in 1955-1956.

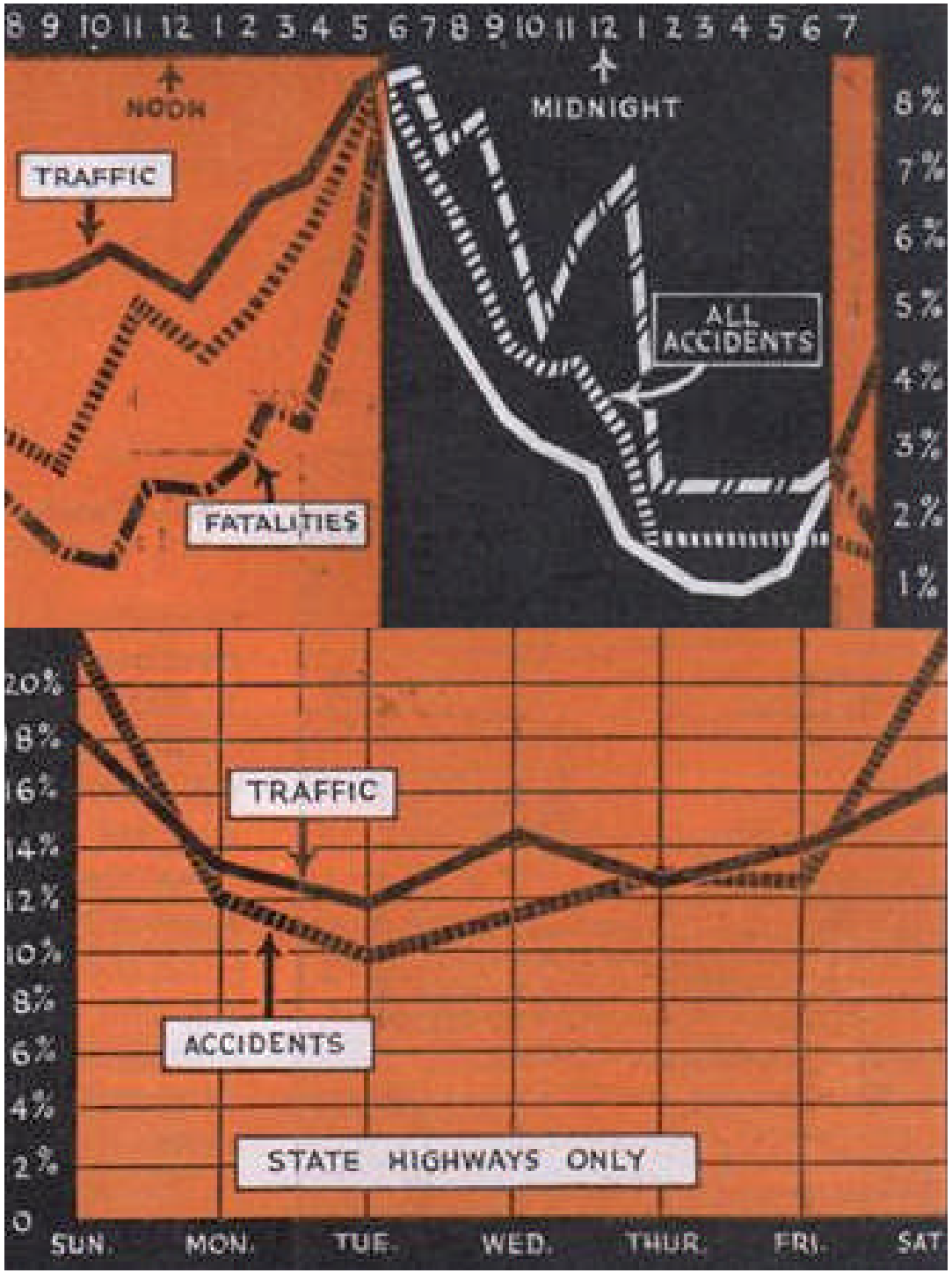
"…No one is suggesting that all our principal highways should be rebuilt. Mere widening would put 8,600 miles of them in A-1 shape, according to Thomas H. MacDonald, Commissioner of Public Roads. Minor relocation – largely a matter of lessening curves and reducing grades without touching the straightaways – would make another 14,000 miles first-class, he says. About 12,000 miles of main road, or somewhat less than a third of the total, should be brand new. Of the 12,000 miles of totally new highways that are needed now, more than 2,000 miles would cross large cities, where some of the nation's knottiest traffic snarls occur every day. It is so expensive to acquire urban rights of way; relocate water, sewer, gas and electricity lines; build bridges for intersecting streets; and construct ramps for cars to use when entering and leaving the main highway that the cost of such construction runs as high as $3,500,000 a mile…"

***Popular Science,* August 1952**

The Immutable Law of Averages

"There's one law which, sooner or later, is going to stop every reckless or careless driver. That's the law of averages. And when this law of averages is applied to traffic accidents today, the rows of cold figures scream a grim warning which every sane motorist should heed because you can't break this law without eventually breaking your neck. From 1922 through 1935 automobile accidents snuffed out the lives of 380,000 persons in this country. That's more than twice the total of those killed in action or who died of wounds in all the wars in which we ever participated. It's more than the combined population of Wyoming and Nevada, and about the same as wiping out the population of Vermont or Indianapolis. And deaths continue to mount…"

***Popular Mechanics*, November 1936**



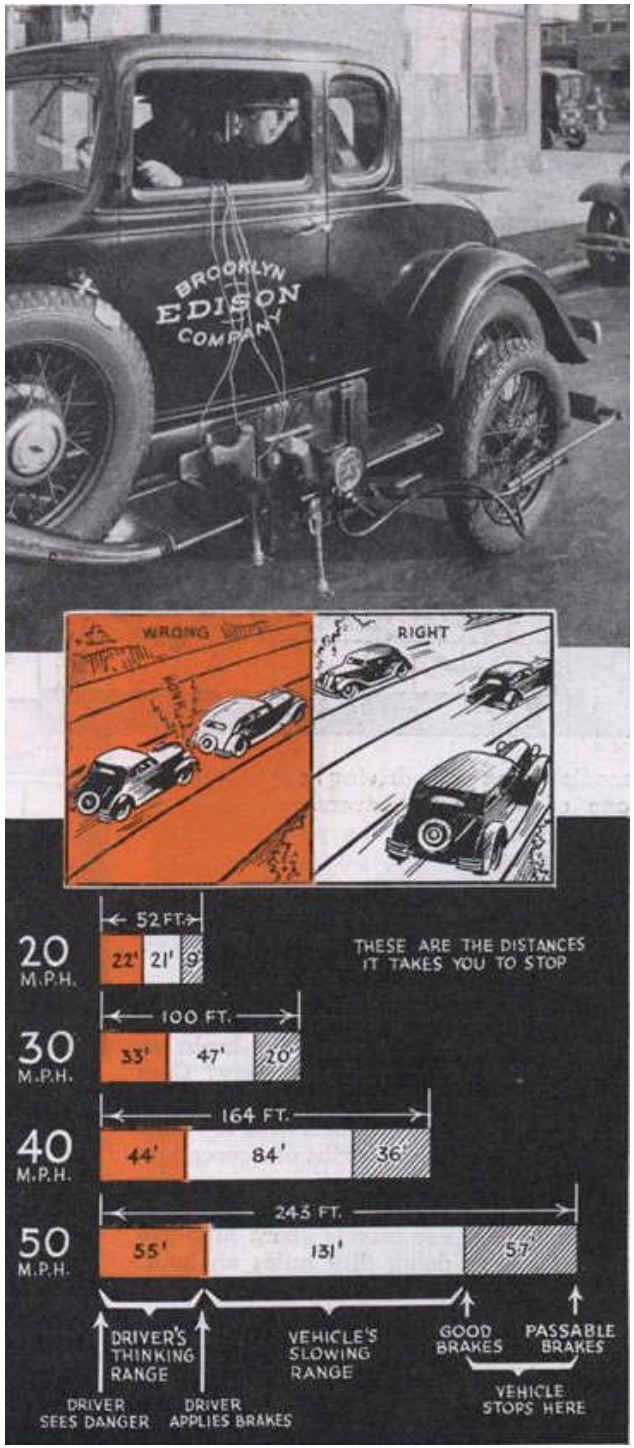
"…Last year 40,000,000 motorists burned up 16,250,000,000 gallons of gasoline driving 26,250,000 cars over our 3,250,000 miles of roads. Statistics of the National Safety Council show this traffic resulted in 37,000 deaths - an all time high - 105,000 persons permanently disabled, 1,180,000 others temporarily disabled and 6,500,000 accidents causing damage to property. And that's one death for each eighty-eight miles of highway, one permanent disability for each thirty-one miles, one temporary disability for every three miles and a property damage accident for each half mile. Truly death and destruction stalk our highways…"

***Popular Mechanics,* November 1936**

<u>Left T&B</u>: caption: "Top chart shows traffic accidents around the clock and bottom one shows accidents through the week. The two charts indicate that the safest time to drive is about 3 a.m. on Tuesdays."

"…There's just one message in all these figures - be careful or be killed. But how do these statistics concern you directly? You consider yourself a careful driver, you've never killed anyone, never injured anyone, perhaps never dented a fender. Well, that's where the law of averages comes in. If the present traffic accident rate continues, one out of every twenty persons in this country will be injured or killed in an automobile accident within five years. And that includes you! Just jot down your name, then add the names of nineteen relatives and friends. One of you will be killed or injured in a traffic smash-up by 1941 by the law of averages. Here's another way of looking at it. Write down the names of three children in your neighborhood. Two of the three are sure - not likely, but sure - to be injured in auto accidents during their lifetimes if the present rate continues. Or perhaps you have a sixteen-year-old boy. If he looks forward to a lifetime of driving and is exposed both to driving and pedestrian hazards, your son also is certain, by the law of averages, to be hurt in a traffic accident unless the present rate is reduced…"

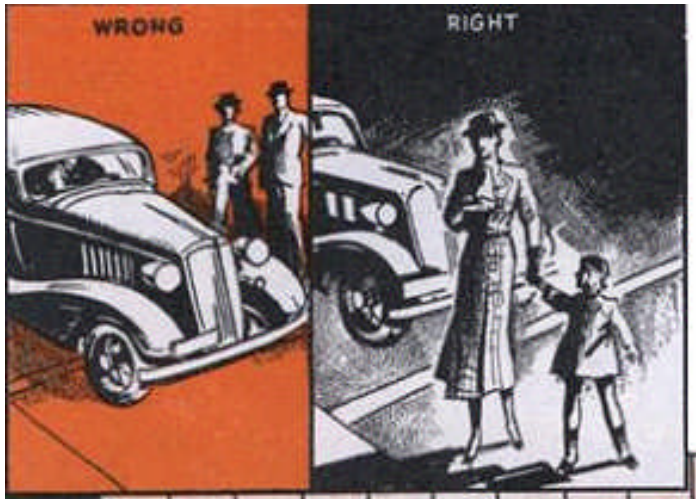
***Popular Mechanics,* November 1936**

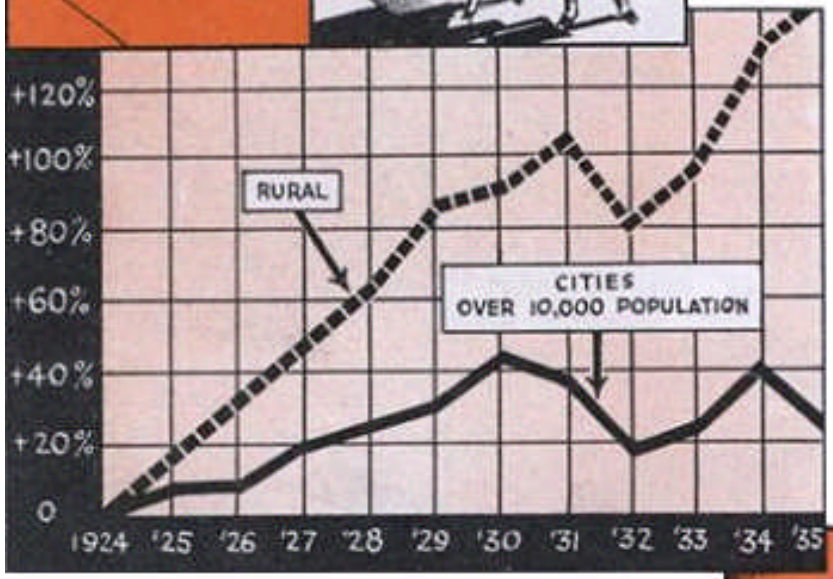


"…Not a very cheerful outlook, is it? Now let's compute the economic loss in addition to human lives wasted. Last year we spent about $2,638,000,000 for new cars and trucks. During the same period accidents cost us more than $1,600,000,000 in wage losses, doctor and hospital bills, insurance overhead and property damage. Thus for each $1,000 spent for new cars in 1935, another $600 went for accidents. Most of that was money wasted. Some of it was your money - paid in high insurance rates if for nothing else. Project this loss over the next ten years and you have a figure approximating half the national debt. So there you are. Automobile accidents are costing you money whether you have accidents or not, and by the law of averages you or someone close to you will be killed or injured in one within five years if present conditions continue…"

***Popular Mechanics,* November 1936**

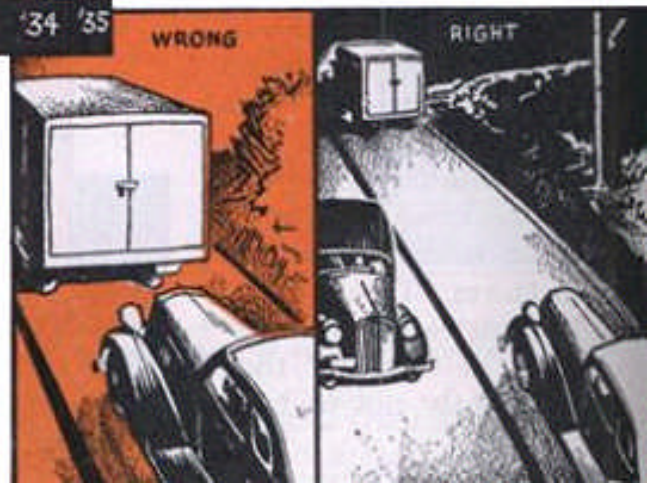
Left: caption: "Top, machine for measuring reaction time and distance required to stop after driver applies brakes. Bottom, distances required to stop with good and fair brakes."





<u>Above & Right</u>: caption: "Right and wrong ways of doing it and chart showing how deaths on open road are going up while fatalities in cities are going down"

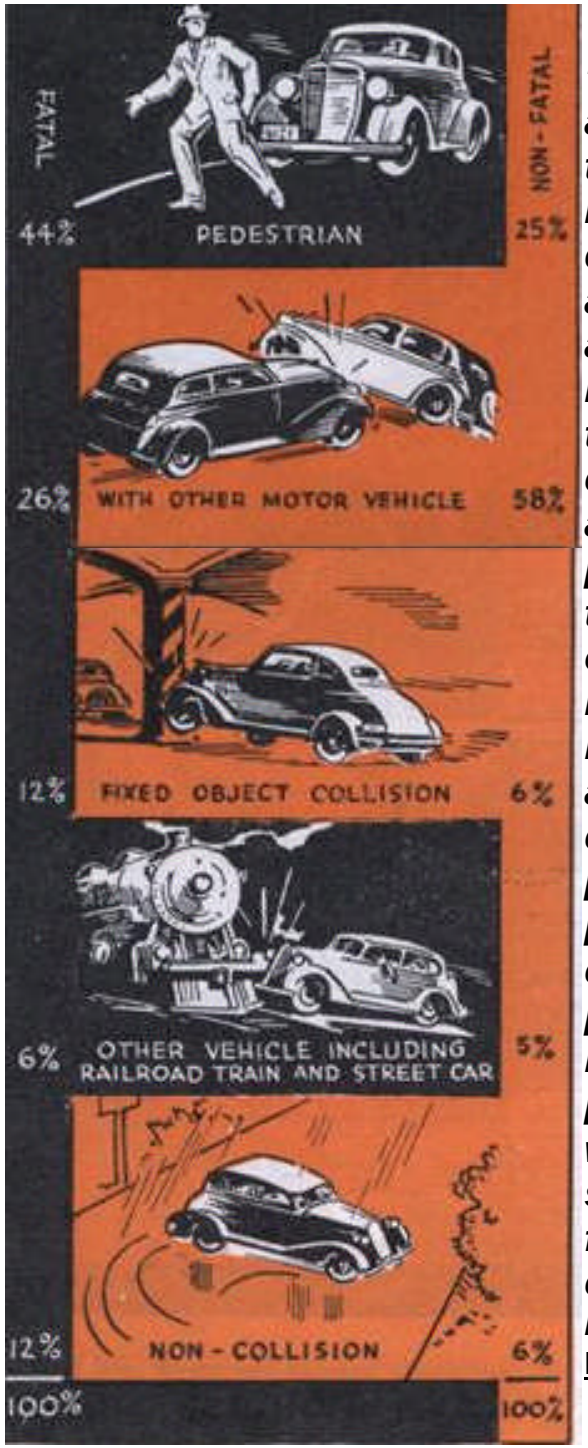
"…For every accident last year which went to pile up the grim total of death and destruction, there were literally hundreds of near accidents - situations when something almost happened but didn't. Every driver has had these narrow escapes - some call them 'lucky breaks.' Now accidents don't just happen; someone causes them. It's human to blame the 'other fellow' but the other chap can't always be in the wrong. You've got to accept part of the responsibility, at least part of the time. Who had all those thousands of accidents last year? Some were physically defective, some didn't know how to drive. But the great majority were competent drivers who had acquired careless habits. They went too fast, passed on hills and curves, sped through intersections, jumped the lights and did a thousand and one other foolish things until the law of averages caught up with them…"



Popular Mechanics, Nov. 1936

"…The higher the speed, the worse the accident. One accident in eleven is fatal at fifty miles per hour and above. At speeds of twenty and under, only one accident in sixty-one is fatal…Modern cars do seventy, eighty or even ninety miles an hour with ease. But can your brain go ninety miles an hour, or even sixty? Cars and highways are faster, but your reaction time isn't. And it still takes time to think. It takes about three-fourths of a second on average. So from the time you see the heifer until the time you do something about it, your car travels about fifty-five feet if you're doing fifty miles an hour. Then after you get your foot on the brake, you need nearly 200-feet more to stop - unless you have poor brakes. With good brakes and good road conditions, you need about 330-feet to stop at sixty miles per hour. Now if your lights enable you to see only 200-feet, your stopping point at any moment is almost 150-feet beyond the distance you can see ahead. You would even be out-driving 300-foot head lamps at that speed. Here's another startling conception of sixty miles an hour. At that speed your car has enough momentum to travel 120-feet straight up if it could 'take off.' So when you do sixty you might as well be 120-feet in the air if you hit something. Just another way of saying that hitting a stationary object at sixty creates the same impact force as though the car were to drop from the top of a twelve-story building…"

***Popular Mechanics,* November 1936**



"…One serious mistake in driving may be your last, so don't be lulled into a sense of security just because you're on the open road. Since 1930 traffic deaths for large cities have been declining while deaths on the open road have been climbing. And don't think you are careful just because you exercise caution in turning. Nine out of ten vehicles involved in fatal accidents last year were going straight ahead. Even at intersections, most accidents involve vehicles going straight ahead. If you cross the center line occasionally, or pass on a hill or blind curve, you should be interested to learn that twenty-six per cent of all fatal accidents and fifty-eight per cent of the non-fatal ones last year occurred in collisions between automobiles. Passing on a hill or driving on the wrong side is an excellent preliminary to a collision. If you're in the habit of looking after you get on the railroad track instead of before, you're headed for the same fate that overtook six per cent of those killed last year and five per cent of the injured. They were killed and hurt as the result of automobiles hitting or being hit by vehicles other than automobiles. Ever take a curve too fast and find yourself struggling for control? If your 4,000 pound car hits a curve of 100 feet radius at thirty miles per hour there's a force of 2,400 pounds trying to pull you into the ditch. That's centrifugal force. Twelve per cent of last year's fatalities and six per cent of the injuries were caused by accidents involving no collisions with anything. Which might prove that anyone can round a corner on two wheels - once. And this brings up skidding. You can't blame a skid on the 'other fellow.' Twelve per cent of all rural accidents in Ohio last year were caused by skids. But when roads were wet, snowy or icy, one-fourth the accidents involved skidding. The lesson seems obvious - but remember also that four out of five traffic accidents occur on dry roads and in clear weather, so don't get careless just because the road is dry…"

***Popular Mechanics,* November 1936**

<u>Left</u>: caption: "Types of fatal and non-fatal accidents"

"…Night accidents are more serious than daytime ones and, on a mileage basis, the accident rate at night is higher. Traffic, accidents and fatalities reach their peak about five in the evening, and their low about three in the morning. Also there are fewer accidents on Tuesday than any other day in the week, and more on Saturdays and Sundays. So in theory, the safest time to drive is about three o'clock of a Tuesday morning. But don't take a chance, even on Tuesdays, because the law of averages will beat you if you keep it up. Why gamble with death when you know death is going to win eventually?"

***Popular Mechanics,* November 1936**

<u>Above</u>: caption: "Road illuminated with 400-candlepower incandescent lamps and reflectors"

Stop the Highway Slaughter!

"…As I see it, there are four primary causes of our annual roadway slaughter: obsolete highways, Stone Age police practices, bad drivers and unsafe automobiles. I don't intend to waste much space talking about out-of-date, overcrowded highways that are real killers by themselves. A lot of people, from President Ike on down, have been working on that one. If everybody agrees with his proposal to spend 50 billion bucks and ten years of effort on the job, maybe we'll have decent roads by the time your son Herman starts asking for the keys to the family crate. In the meantime, standard Federal highway laws would help somewhat to straighten out the 48-state confusion..."

***Mechanix Illustrated,* November 1954**

<u>Above L&R</u>: caption: “In these two smashups, in California and in Virginia, a total of nine people went to their graves”

<u>Left</u>: caption: “Seven persons died in this head-on collision”

"…In New York City it is possible to take your driving test in traffic near Sutton Place, a little-traveled road along the East River where you will never go faster than 25 miles an hour. If you make all the right-hand signals and don't run over the inspector, you will most likely receive a driver's license - a certificate which will permit you to travel the Penn Turnpike, where 70 mph is legal, and give you the right to drive in states where 100 mph is not frowned on too hard, such as the speedways near Detroit. That arm-waving test at eight miles an hour back in New York will do you a lot of good here if suddenly your car goes into a dry slide at 70 or better. You can end up awfully dead and still be within the legal speed limits - in fact, not violating any traffic law whatsoever…"

***Mechanix Illustrated,* November 1954**

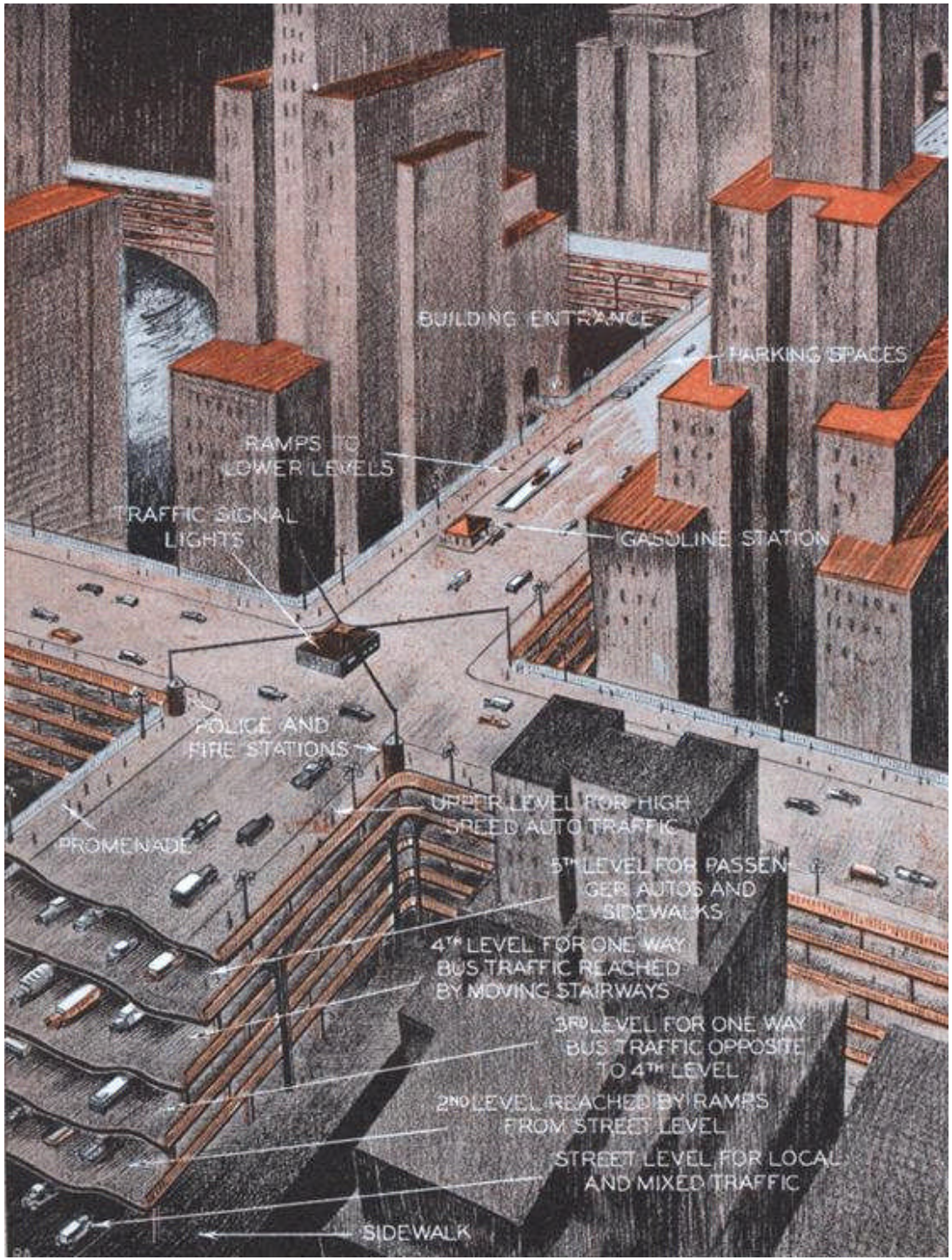
"…The cause of many accidents, and the most neglected, is the equipment naive owners are conned into buying. Regardless of what the ads say, all cars are not safe, and for a number of reasons…There are a number of truly good, road-able automobiles made in America today. On the other hand, there are makes which are real killers…As Harley Earl, vice-president in charge of General Motors styling, recently stated, American women are the principal influence in buying today's automobiles. Most women are more concerned with luxury and comfort than they are with an automobile's athletic prowess. All manufacturers know this and, in order to meet the competition from their fellow balloon builders, they have had to go overboard with mushy suspension, ridiculously low-pressured tires and out-of-balance chassis to get the rear passenger seats off the rear axles…Naturally, some cars have gone even further than others and have proved to be very popular with the buyers…In fairness to the manufacturers, the latest fad of blaming highway deaths on the so-called horsepower race is ridiculous. In many cases that extra horsepower is needed to get you safely around one of those railroad-car-long tractor-trailers on a two-lane highway. In a pinch, a skilled driver will be a lot safer in a good car with 200 horsepower than he will in one with half that much moxie…"

***Modern Mechanix,* March 1954**

"…On the other hand, a little item like tire pressure can, under some conditions, mean the difference between living and dying. A car with 32 pounds of air often can be controlled in a semi-emergency situation where a car with factory-recommended pressure of 26 or 24 pounds will mush, plow and become completely unmanageable…Why is this tire stuff so important? When a tire is out of balance it develops a gyroscopic action whose intensity increases with speed. At 100 mph a real dog of a tire can almost tear the wheel off the axle, the eccentric action is so severe. At any speed above 60 the car with unbalanced wheels can become extremely uncontrollable and, in some cases, will actually develop a galloping tendency. If you have to brake hard, the offbeat wheel motion makes it almost impossible to hold the car on a straight line…"

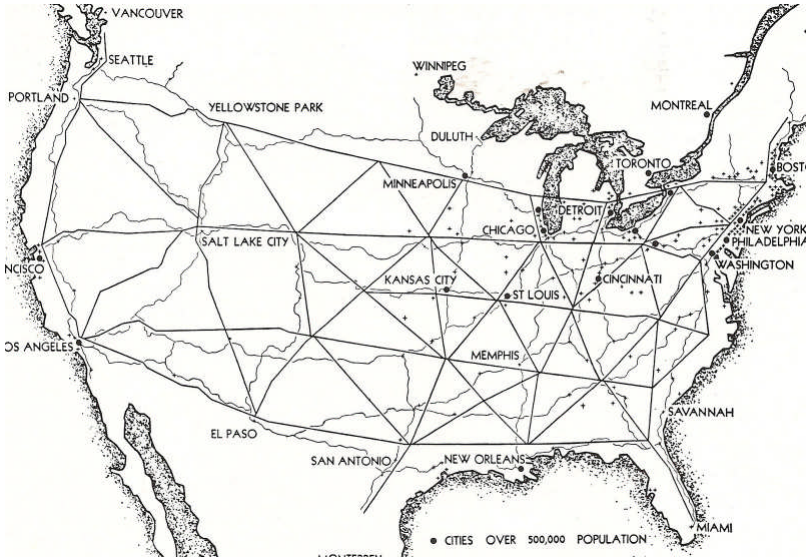
***Modern Mechanix*, March 1954**

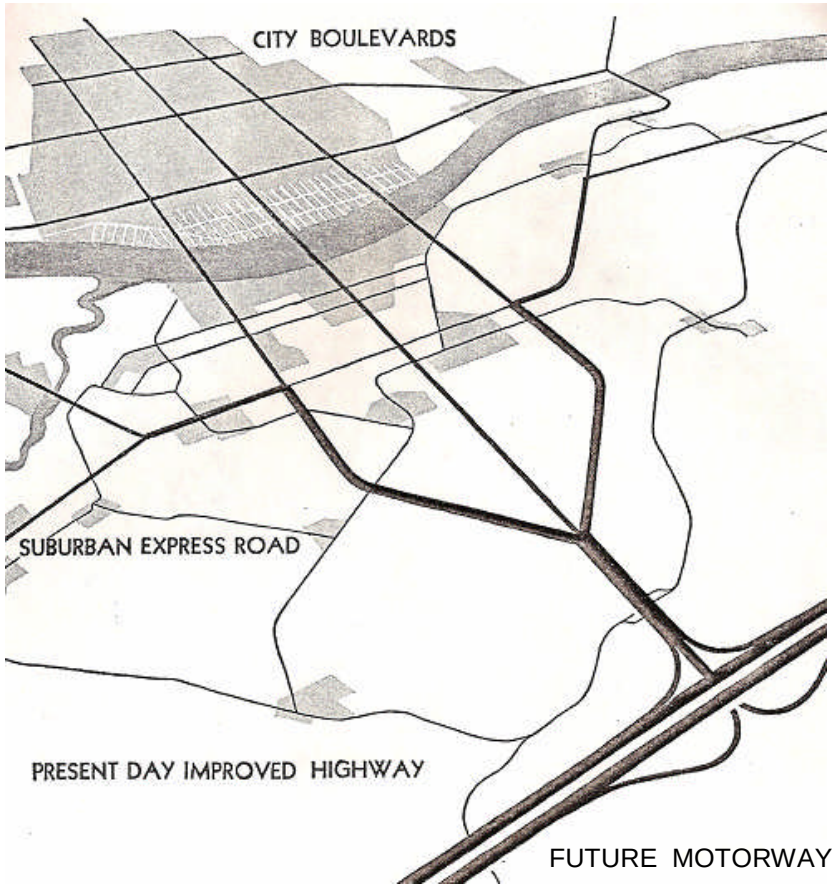
Speed Highways of Tomorrow



"Here is an artist's conception of the amazing multiple highway plan of Dr. John A. Harriss, former health commissioner of New York City. The plan calls for six traffic levels. Each level is for designated traffic. There is an express traffic level, two one-way levels for bus traffic and other plans to expedite traffic. This proposal of Dr. Harriss is gaining in favor as one of the most feasible of many schemes advanced to adequately handle the constantly increasing motor and pedestrian traffic."

***Modern Mechanix*, March 1930**



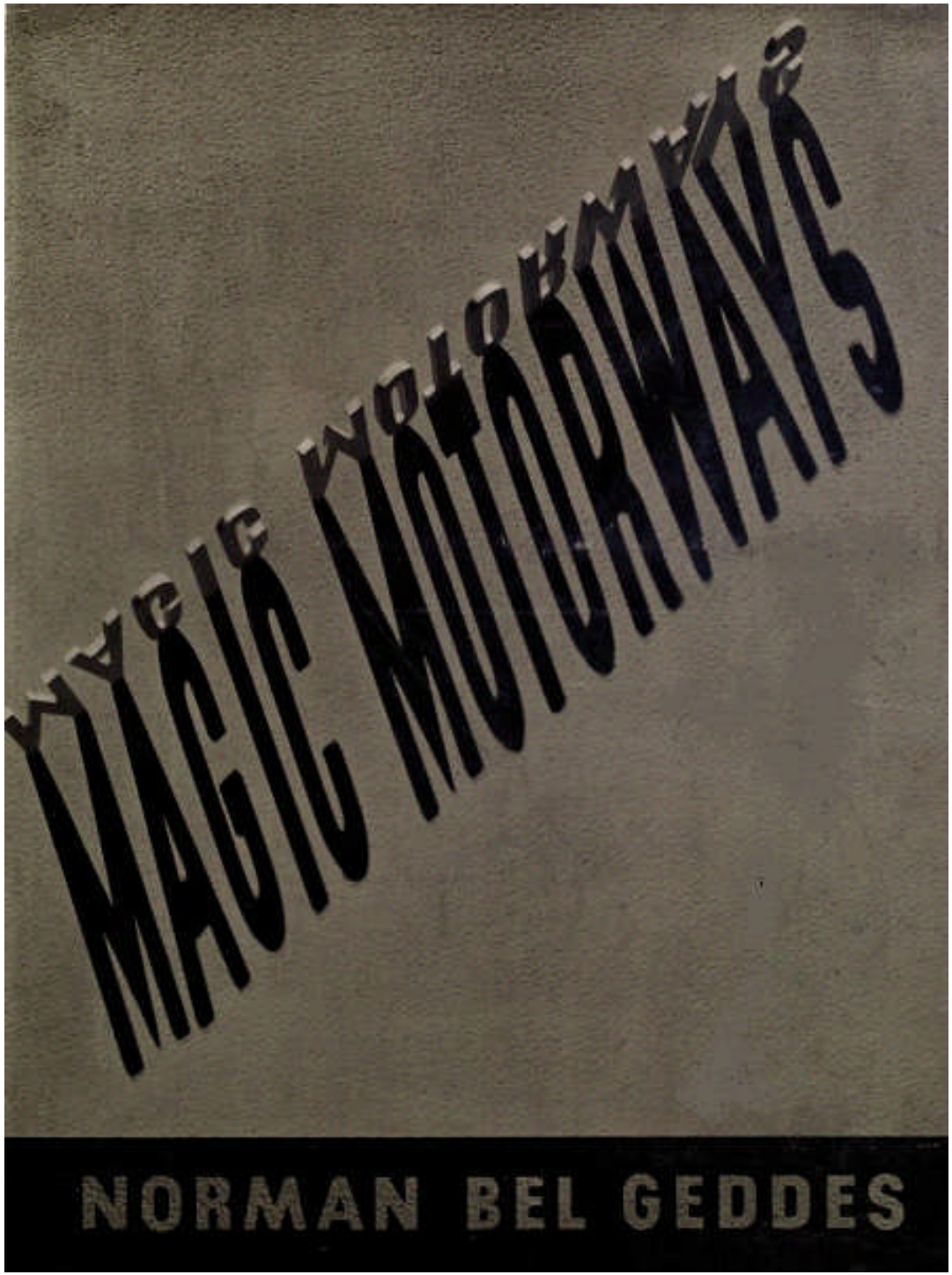


"…Contrary to accepted practice, the motorways must not be laid down using cities as their terminal points, nor must they be allowed to infringe on city boundaries or the city proper...While express motorways must be designed to carry fast, long-distance traffic, no existing roads need be scrapped. The country's 1940 roads will continue to carry local traffic, and their usefulness will be enhanced by connection with the new motorways...The plan (shown on the map) is based on a relatively brief, preliminary study...Its design sums up the basic requirements of such a comprehensive plan. See how directly the lines lead from one region to another. Notice that a direct route connects Seattle and El Paso - making possible uninterrupted travel from the northwest tip of the United States to the southernmost section...Nowhere do the cities connect the motorways, although they are all fairly close to them…Traffic moves in almost a straight line from Boston to New Orleans without passing a single city. Yet no city of over 100,000 is more than 50 miles from a motorway and most of them are half that distance. Look at the northernmost motorway, which runs east-west across the top ties of states. It avoids Grand Rapids by 35 miles, and makes straight for Lake Michigan. At this point the lake is 50 miles wide. Never mind. There is no let-down on the motorway. It shoots directly across the lake on a long bridge..."

Norman Bel Geddes

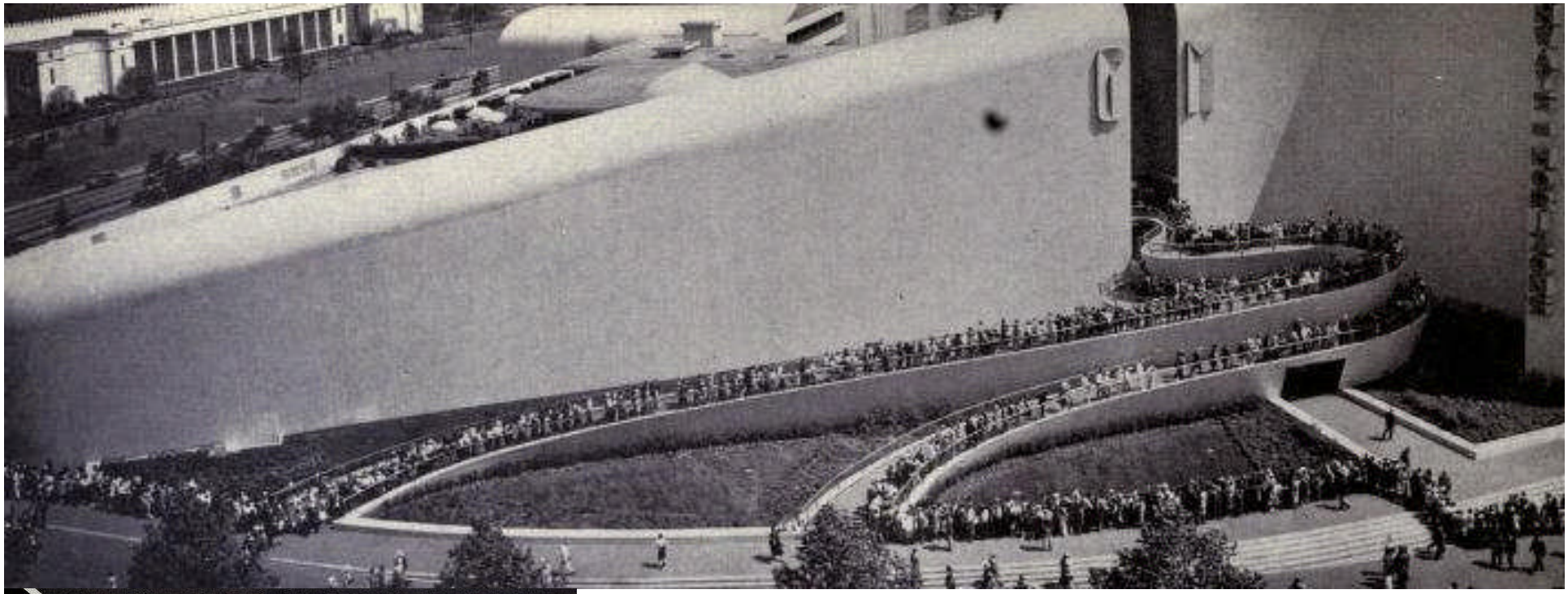
RE: excerpt from his 1940 book *Magic Motorways*

Left: "National Motorway Plan" (top) and diagram entitled: "Motorway Feeder to City" (bottom) - both from Geddes' book



"With over thirty million automobiles in the United States today, and the problems of vehicular transportation increasingly complex and pressing, it seems almost incredible that this should be the first and only book that has ever comprehensively treated the subject both historically and with a view to offering a solution. Norman Bel Geddes, one of the foremost designers in the world, has been studying the situation intensively for several years. Out of his research came recently his spectacularly successful General Motors Futurama for the New York World's Fair, and now this fascinating book. 'Magic Motorways,' after a brief review of the history of old and new roads and automotive traffic in America, presents a detailed plan for an entirely new type of national motor-ways system. At first, some of its features may strike the reader as a fantastic dream, but Mr. Geddes proves their practicability…"

RE: excerpt from the dust jacket synopsis of *Magic Motorways*



"More than 30,000 persons daily, the show's capacity, inch along the sizzling pavement in long queues until they reach the chairs which transport them to a tourist's paradise. It unfolds a prophecy of cities, towns, and countrysides served by a comprehensive road system…"

***Business Week,* 1939**

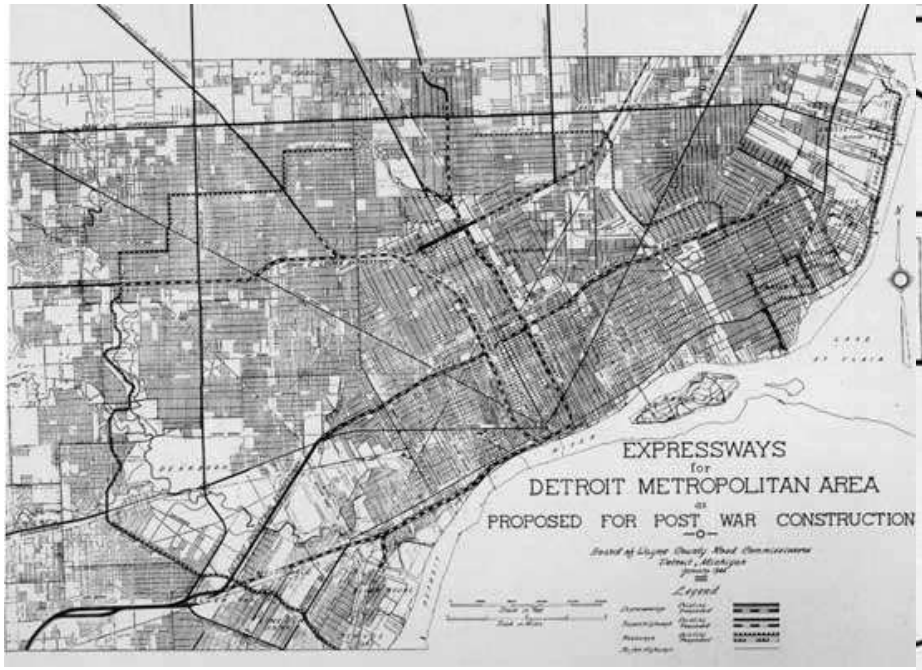
<u>Above</u>: caption: "Entrance ramps to General Motors World's Fair Futurama exhibit"

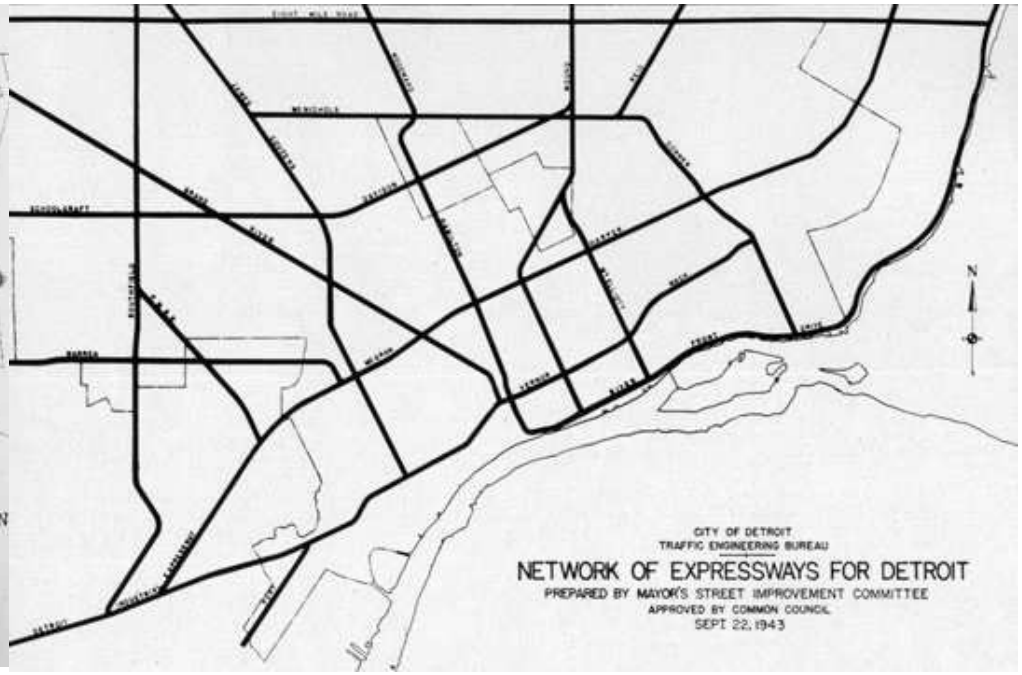
<u>Left</u>: caption: "Street intersection – City of Tom-orrow – World's Fair 1939"

<u>Left</u>: contrary to his 1940 book *Magic Motorways,* which outlined his idea for a future interstate highway system to skirt rather than pass directly through cities, *Norman Bel Geddes'* "Futurama" exhibit in the *General Motors Pavilion* at the 1939/40 *New York World's Fair* boldly represented (in scale model form), superhighways of the distant year 1960 passing through the heart of metropolitan areas, even having the skyscrapers of the future integral to their design.

"…In by-passing the cities and staying out of the towns and villages, something is lost. Those who wish to see and understand the people of the country, lose this opportunity. On the other hand, if the ordinary traffic of commerce and the intercity movement are carried on these highways, this will relieve the other roads of much of the traffic burden and make them more comfortable for touring. In general, the existing roads, particularly in the vicinity of the larger cities are not comfortable for the tourist because of the large amount of mixed traffic including everything from large motor truck trains down to ox-carts, bicyclists and pedestrians…"

***T.H. MacDonald,* BPR Director (1936)**





"…But urban highways are every bit as vital as new construction in open country – if anything, more so, because nearly all the automobile traffic in the United States goes only 20 miles, the average distance from home to work, and in most cases work is located in or on the outskirts of a city. The only answer, despite the costs, is expressways. Detroit's expressway system, which will eventually lace that huge, highly industrial city with 105 miles of broad, sunken arterial highways, already has dramatically proved its value, though only a short section of it has been completed…"
***Popular Science,* August 1952**
<u>Above L&R</u>: map (left) and diagram (right) of proposed expressways for *Detroit, MI*

"…The present streets of Detroit and its environs consist of wide boulevards and adequate avenues on the outskirts of the city but like other cities the core is congested and choked with traffic. The present streets of Detroit and its environs consist of wide boulevards and adequate avenues on the outskirts of the city but like other cities the core is congested and choked with traffic. The arterial vehicular traffic jams in Detroit can be cleared only by breaking the bottlenecks in the heart of the city where the greatest volume occurs. Traffic studies clearly show that a large percentage of traffic proceeds between its origin and destination on illogical routes. The crow-foot avenues, the confused tangle of the old city, the rectangular pattern of the newer developments, the network of railroads, the absence of breaks in topography through which arteries might have been built behind the growth of the city, the monotonous flatness downtown which prompted the solid building with no open spaces between developments, the relation of business and industry to the waterfront; all these contribute to the circuitous travel necessary to reach most points by automobile. The streets of Detroit are wider than those in most cities but they arc not wide enough in the right places and cannot he stretched enough at most throats of congestion to meet the increasing traffic loads. The greatest barriers to convenient and safe automobile travel are the automobiles themselves which were built faster than the streets were modernized to accommodate them…"

***Detroit Transportation Board,* 1945**

"…The locations of the principal business districts, secondary business sections, industrial and manufacturing areas, railroads and terminals, educational institutions, recreation centers, hospitals and other features of community development influenced our conclusions in selecting the routes for the combined expressway and transit system. The character of the buildings on the proposed rights-of-way and the effects of replacing them with the proposed improvements were important considerations, particularly the influence on the neighborhoods. The effect of the improvements on desirable future community development and on the stabilization of manufacturing and business areas and residential neighborhoods along the routes and in the areas served by them has prompted many of our decisions. With no natural open spaces to follow, the new expressways must be located largely through solid development. It is fortunate that the general pattern of traffic flow coincides with belts of depressed property cheap enough to acquire for wide traffic arteries…"
***Detroit Transportation Board*, 1945**

"…The first section – a segment 2.5 miles long – was opened on July 9, 1951. It consists of a divided six-lane highway running 18-feet below the level of adjacent streets, with a right-of-way about 300-feet wide. Traffic is one-way over the three lanes on each side. Trucks, buses and passenger cars travel at an average speed of 45 to 50 miles an hour. Already the expressway is carrying five times as many cars per lane as the average main thoroughfare of older vintage. A heavy December snowstorm that clogged narrower nearby streets where parking was permitted scarcely slowed down the expressway traffic…"

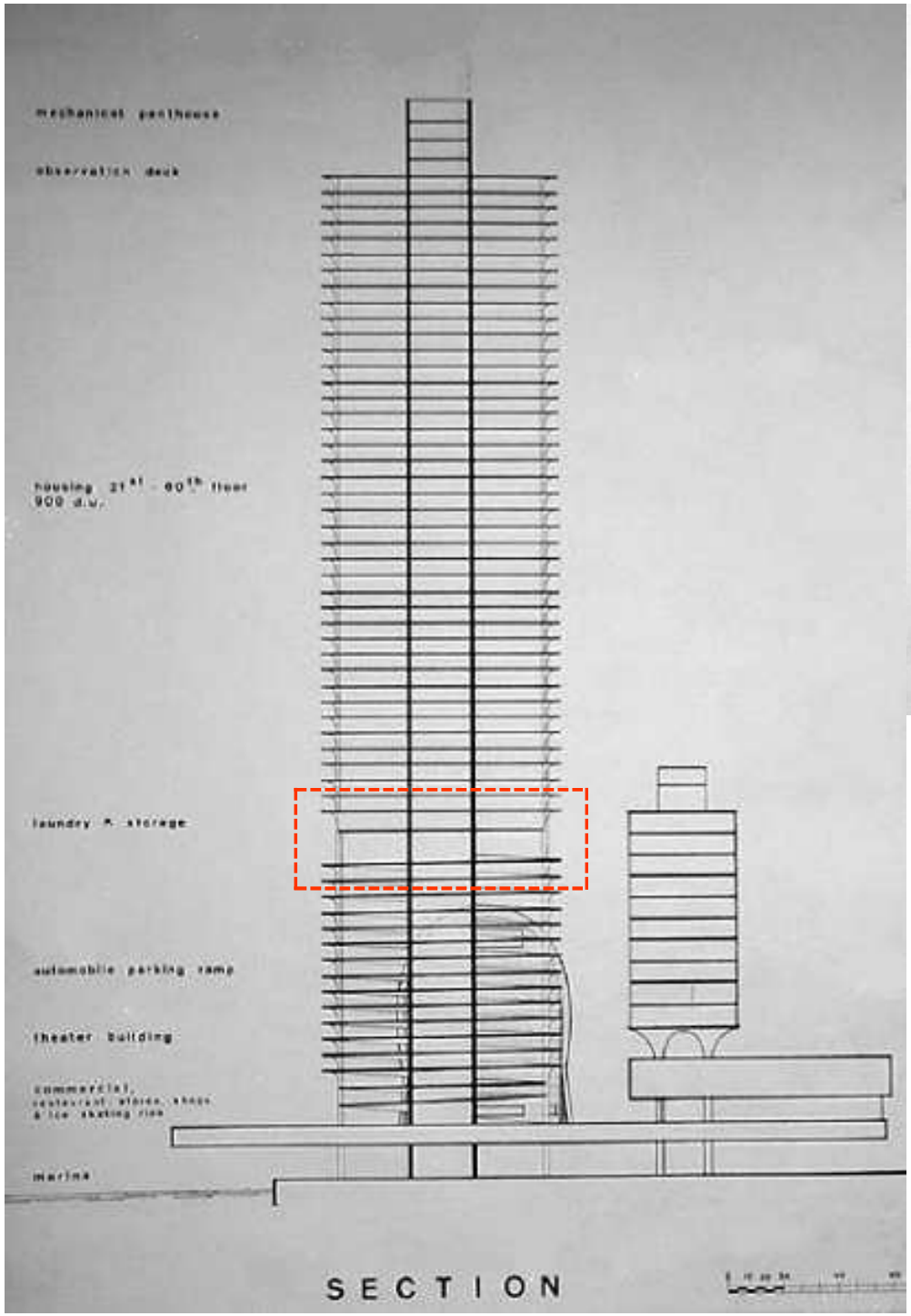
***Popular Science,* August 1952**

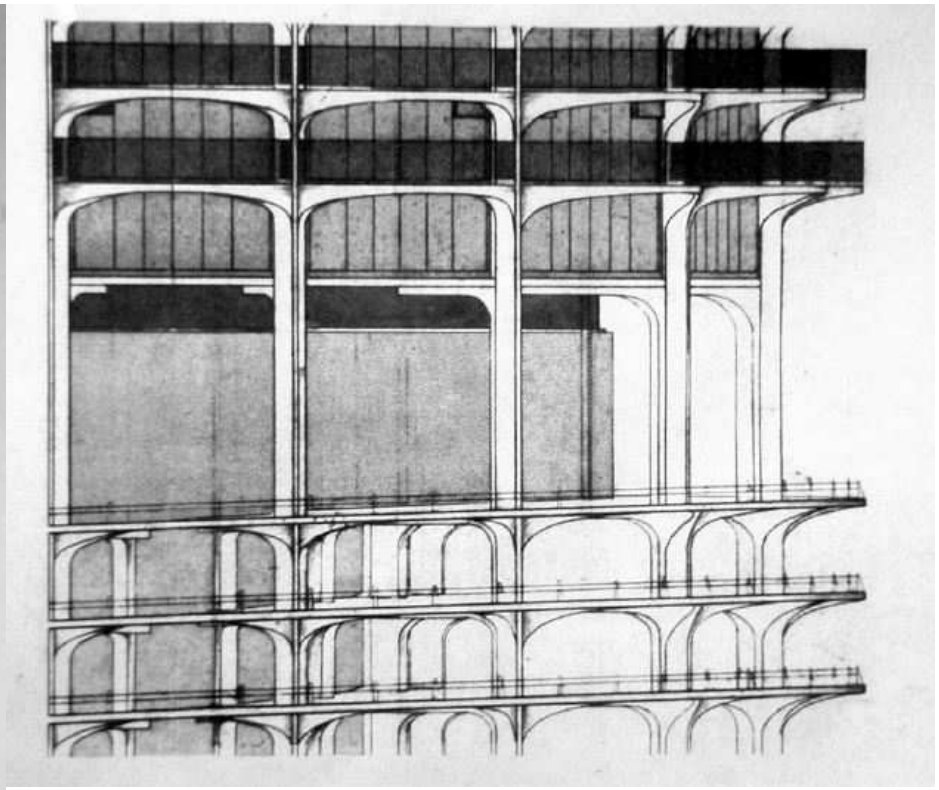
<u>Above</u>: caption: "First completed portion of the John C. Lodge Expressway. The above photo shows a New York Central steam locomotive using the rail-road overpass near Holden."

"…Expressways alone are not enough to ease the city traffic problem completely, however. Connecting streets in many instances must be widened, other streets made one-way and, especially, vast new parking space created. A frequently repeated suggestion for solving the last problem is to build skyscraper parking garages, with relatively small taxable frontage…"

***Popular Science,* August 1952**

Left: Completed in 1964, Chicago's *Marina Towers* is composed of two identical towers which were originally designed to include a concert hall, retail stores, skating rink and bowling alleys. Adjacent to the *Chicago River* in the downtown loop, parking for the structure is self-contained in the densely populated area. The lower-third of each of the 65-story tower/s is a continuous up-spiral parking garage with space for 896 vehicles each.



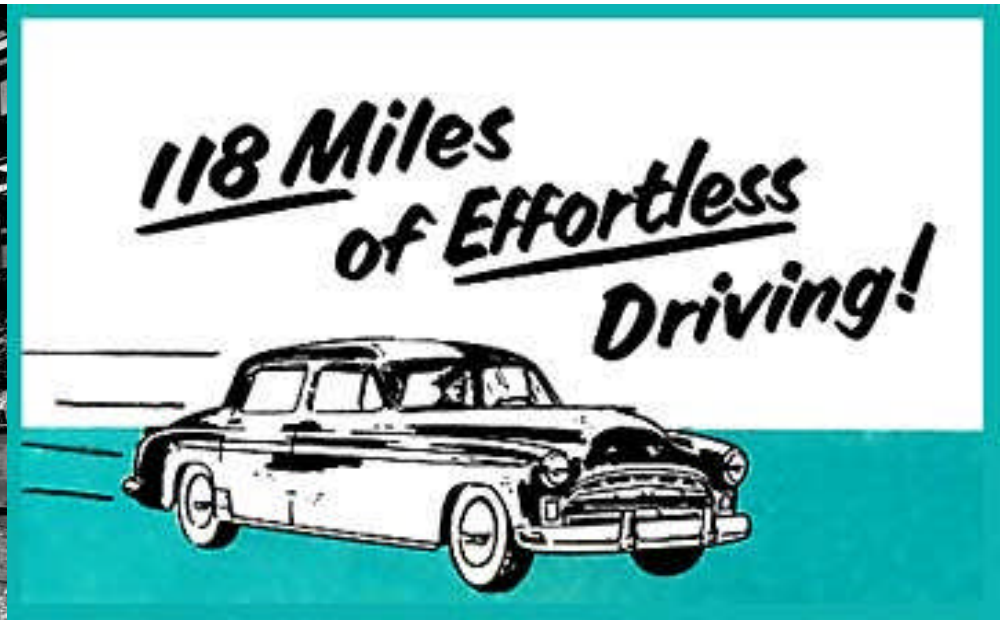


<u>Above</u>: elevation of parking garage/apt. floor transition (highlighted on section)
<u>Left</u>: vertical section through tower

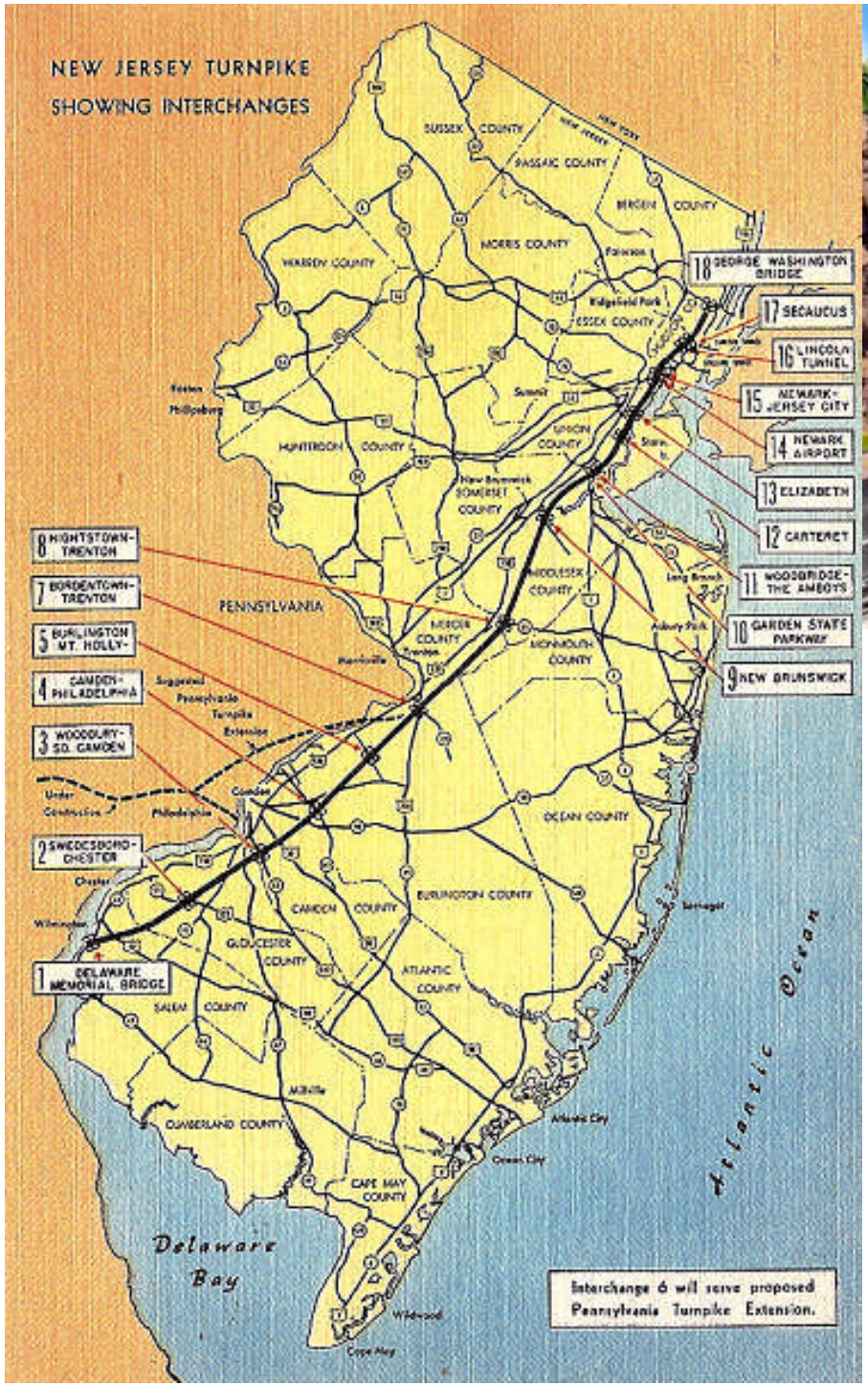

Are you
Good Hands?
Allstate

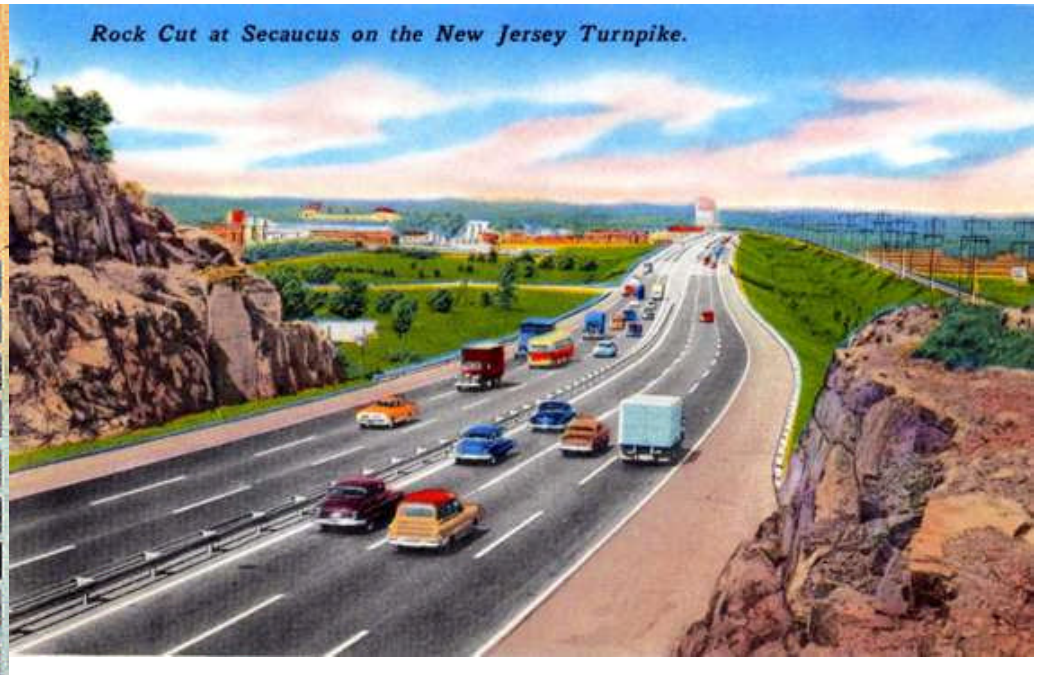
"…No one denies the country's desperate need for relief from its traffic situation. But how are we to raise $50,000,000,000 required, at a minimum, to improve our highways over the next 15 years? At least 33 states have chosen or are considering the alternative of toll roads. About 700 miles of superhighway on which tolls are collected have been built since 1940. Since these roads are not free, the Federal Government disapproves of them and does not think that they properly belong in the interstate highway system, but they help to brighten the outlook considerably for the motorist who is willing to pay around a cent a mile to travel on them. Long-distance truckers save so much time and wear and tear by routing their wheeled behemoths over toll roads that they unhesitatingly pay up to 3.5 cents a mile for the privilege…"

***Popular Science,* August 1952**



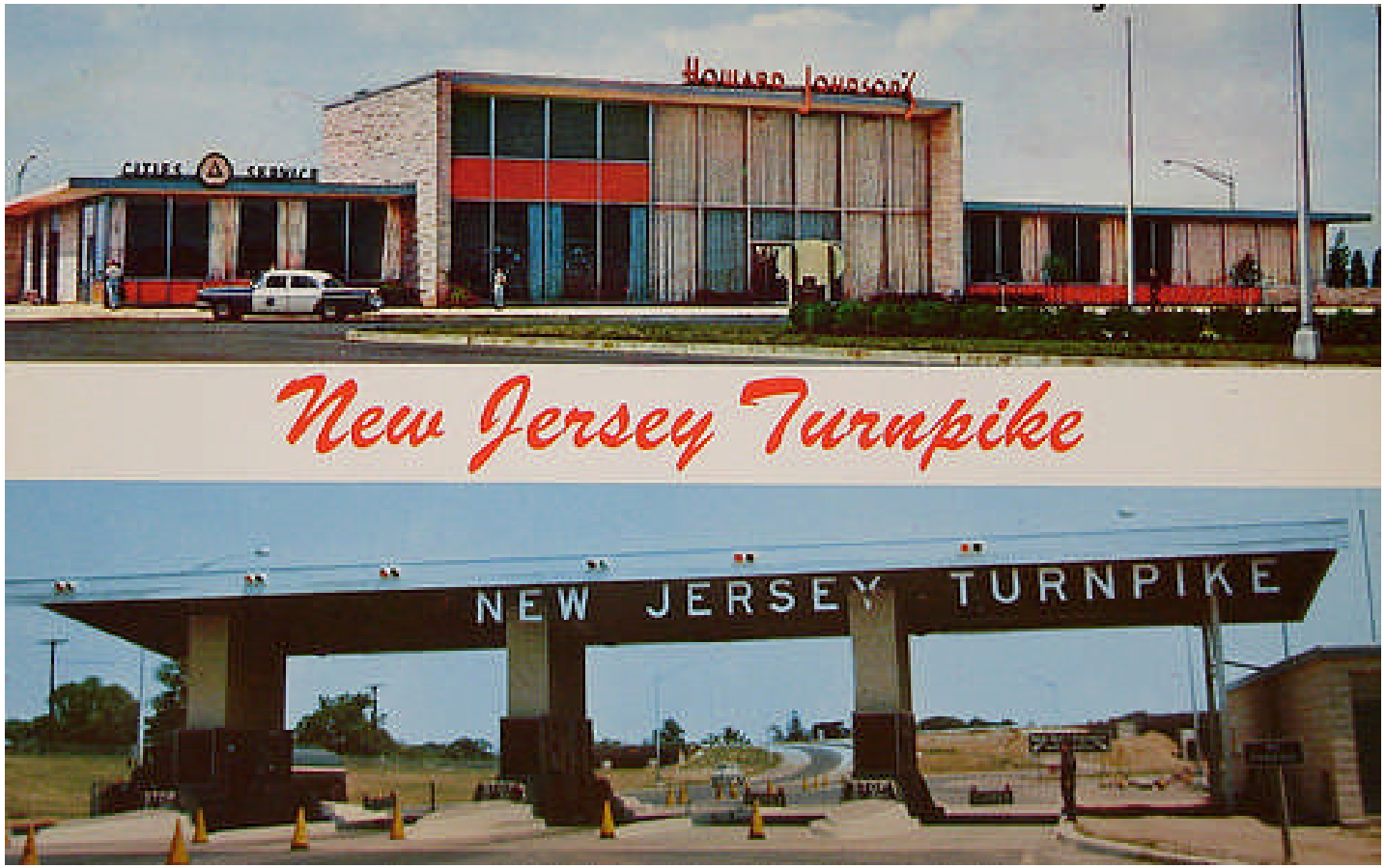
"…New Jersey in late May reported that income from its new 130-mile turnpike was flowing in at a rate high enough to pay of the $255,000,000 cost of the road in 15 years instead of 25. Heartened by such demonstrations as this and always deeply reluctant to increase taxes, state legislators have encouraged the drawing up of plans for more than 1,000 additional miles of toll roads…"
***Popular Science,* August 1952**





"The world's most modern express high-way engineered for utmost comfort and safety. The NEW JERSEY TURNPIKE is the quickest and safest route connecting New York and New England with points South and West."

New Jersey Turnpike Authority, **November 1951**


HOWARD JOHNSON'S
New Jersey Turnpike
NEW JERSEY TURNPIKE

"…The Bureau of Public Roads, on the other hand, doesn't advocate toll roads, for these reasons:

- ***They can't possibly be substituted for free roads through cities, because of the short distances involved;***
- ***In many cases, before the roads can be paid for, they'll start wearing out. As a consequence, they may never be paid for;***
- ***Toll roads are primarily for long-distance travel. The distance between toll gates necessarily is too great for the roads to serve local motorists. Therefore, there must still be parallel free roads. Since the highway user is, in effect, paying for both types of roads, he might better foot the bill in higher taxes and enable all roads to be 'free'…"***

***Popular Science,* August 1952**

Out of the Muddle

The turn of the century brought a new invention into the hands of Americans. At first considered an amusing toy with only about 8K of them in the U.S., the automobile would develop into the dominant form of transportation in the U.S. When *Horatio Nelson Jackson*, after countless breakdowns, succeeded as the first person to cross the North American continent in 1903 with an automobile, it did more than signal the rise of the "horseless carriage." The event indicated a growing need for automobiles that were durable enough to survive long distance travel. Larger gas tanks, cargo space and more durable tires were all useful adaptations, but adapting the automobile was only half the battle. First, the automobile had to be affordable. Cars were a rich man's novelty until Henry Ford's assembly line cut production costs and released the 1908 "Model T" onto the market. Automobile ownership skyrocketed, but then there was the overwhelming problem of poor road conditions.

"…A new movement is under way, however, to solve the whole mess without toll roads but with a fresh approach. The movement is called 'Project Adequate Roads,' or PAR. PAR backers, a powerful group that includes car, car-parts and tire manufacturers, truckers, bus lines, cattlemen, the AAA, and gas and oil producers, believe that states should be prevented from diverting income from car-use taxes to purposes other than road building and maintenance. If all this tax money went where it should, they say, we could afford to improve our roads faster and on a broader scale. They also urge that state highway departments be required to make 'sufficiency ratings' of every section of their main roads. The rating is based on three factors: safety, condition and the percentage of traffic served. The maximum rating is 100, and the extent to which each section of road falls below 100 in its sufficiency rating quickly shows how badly it needs attention. The PAR people feel that this system will see to it that no highway funds are wasted on pet and sometimes impractical projects of political big-wigs. In the twenties, a nationwide movement to 'get us out of the mud' resulted in building most of the miles of paved road now considered inadequate. PAR's slogan is 'Get us out of the muddle!'"

***Popular Science,* August 1952**

From its inception in 1926, the *Federal Highway System* underwent frequent changes as engineers sought to improve the safety and efficiency of roadways within the national system. At first simply a splicing together of local roads that connected lines of settlement, many of the road alignments included in the original 1926 system were a reflection of already existing patterns of movement within an area. However, over time the roads within the Federal system came to reflect the quest of engineers to move increasing amounts of traffic efficiently and directly across the country.

<u>Above</u>: caption: "Car descending 1920's alignment of Route 66 at La Bajada, NM"

<u>Above</u>: caption: "Often, road conditions were abysmal, as this early traveler experienced while navigating through mud."

<u>Left</u>: caption: "Route 8, Imperial County, 1910. This image is another view of the road conditions early travelers endured."

"In outlining the 187,000 miles of road comprising the Federal-aid system of highways, it has been arranged that not more than seven percent of the total road mileage of any one state be included. Not to exceed three-sevenths of this will be designated as primary or interstate highways, and the remainder secondary or inter-county highways. The plans cover a 15 to 20-year construction program, with provision for enlargement at the end of that time."

***Popular Mechanics,* March 1923**

RE: before 1920, most roads in the U.S. were dirt, hard-packed and rutted. Cars got stuck in the mud so often that local farmers could make a significant amount of money using their horses to haul them out. Dust was also a constant problem, so much so that drivers wore dusters and goggles. Gravel and macadam (oil and crushed rock) roads were improvements, but highway departments willing to spend the money could produce concrete and asphalt roads. Aside from the roads themselves, many other aspects of travel were only just being developed by 1920. There were few, if any, gas stations, convenience stores and/or mechanics. Long-distance highways needed to be planned, signposted and mapped. "Good Roads" movements and automobile clubs worked to improve travel for motorists. Their work included building the *Lincoln Highway*, the *Yellowstone Highway* and the *National Old Trails Road*. The Federal Government also had a hand in funding roads and their efforts culminated in the *Federal-Aid Highway Act of 1956*, which established the *Interstate Highway System*.

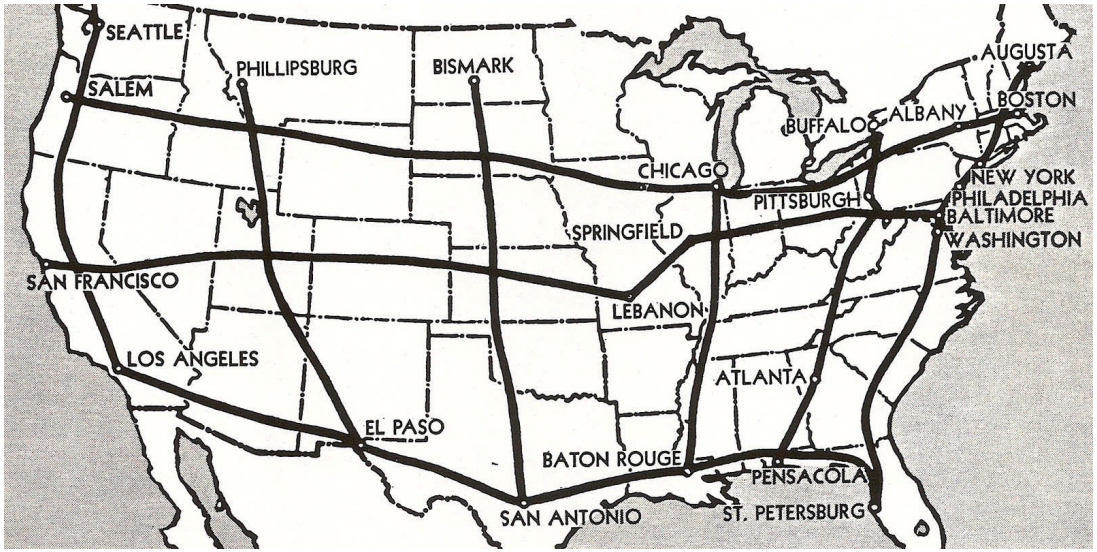
A Victory for Roads

"The Chief of the Bureau of Public Roads is hereby directed to investigate and make a report of his findings and recommend to the Congress not later than February 1, 1939, with respect to the feasibility of building, and cost of, superhighways not exceeding three in number, running in a general direction from the eastern to the western portion of the United States, and not exceeding three in number, running in a general direction from the northern to the southern portion of the United States, including the feasibility of a toll system on such roads…"

RE: excerpt from the *Federal-Aid Highway Act of 1938*

"The system of main highways in the United States is by far the most extensive of any in the world. Only the most out-of-the-way places cannot now be reached over a surfaced road. Many miles of main highways are broad, direct routes over which vehicles can travel continuously at the touring speed selected by the driver without the need for slowing down because of sharp curves, steep grades, or other obstacles and there is frequent opportunity to pass overtaken vehicles…Many of our most used and important roads are among those that must now be classed as very inadequately improved. These are the roads that were first recognized as of outstanding importance and as such were first improved with surfaces of the highest type designed according to the standards of early road builders. There was general acceptance of these standards as sufficiently advanced - in fact, there was much opposition on the grounds that they were too advanced. The great increase in highway use and the recent marked increase in vehicle speed have forced the adoption of much higher standards…There has been wide public interest in the creation of a system of multiple-lane highways, built according to the highest standards of grade and alignment, with opposing traffic separated by a center parkway, bypassing all cities, with structures separating streams of traffic at all highway and rail crossings. The large volumes of traffic that flow between densely populated areas, when not too widely separated, in many instances appear to justify the high cost of such improvement…"

RE: excerpts from the *Bureau of Public Roads* annual report (for fiscal year 1938)



"Picture a 15,000-mile network of twelve-lane motor speedways spanning the nation - three of them linking the Atlantic and Pacific coasts, six more crisscrossing the country north and south - and you will have an idea of the vastness of a spectacular highway plan proposed by Senator Robert J. Bulkley of Ohio. Requiring twenty-five years for completion, the mammoth gridiron of superhighways would change long-distance driving from a motorist's nightmare of snarled traffic into a reality of fast, safe transportation. It would represent an impressive start toward an era of scientifically constructed speedways, and crash-proof cars of radical new design to run upon them, foreseen by leading experts for the not-too-distant future…"
***Popular Science,* May 1938**

RE: throughout the 1930's, private individuals and members of *Congress* conceived superhighway proposals. Senator *Robert J. Bulkley* introduced one of the most prominent proposals. His bill; S. 3428, called for creation of a "United States Highway Corporation" to build three transcontinental and seven north-south superhighways, linked by spurs and connectors (see map above). The corporation would build the superhighways on a 600-foot wide strip of land, with the excess land leased or sold to concessionaires as a source of revenue. The "New York State Method" of condemnation, employed by NY State's master builder *Robert Moses*, would be used to acquire the land. The corporation would condemn the land, take it over and begin work immediately. Payment for the land would be agreed to later either through negotiation or the courts.

"$8,000,000,000 Highway Project Wins Encouragement of Roosevelt Bulkley Shapes Bill for East-West and North-South Transcontinental Toll Spans - Favored if "Pump-Priming" Is Needed

Washington, Feb. 6. - Should President Roosevelt decide to spur recovery by some form of 'pump-priming,' as some of his close advisers are urging, he may support legislation for the construction of a transcontinental system of self-liquidating super-highways. The movement for such legislation is gaining popularity among members of Congress, some of whom are searching for an appropriate form of government construction to benefit their constituents in an election year, and the plan is said to have support in the War Department, the Bureau of Public Roads, and from at least one member of the Board of Governors of the Federal Reserve System...The President was reported to have told the Senator that he had been thinking of a similar plan for some time, and to have told him to draft a bill."

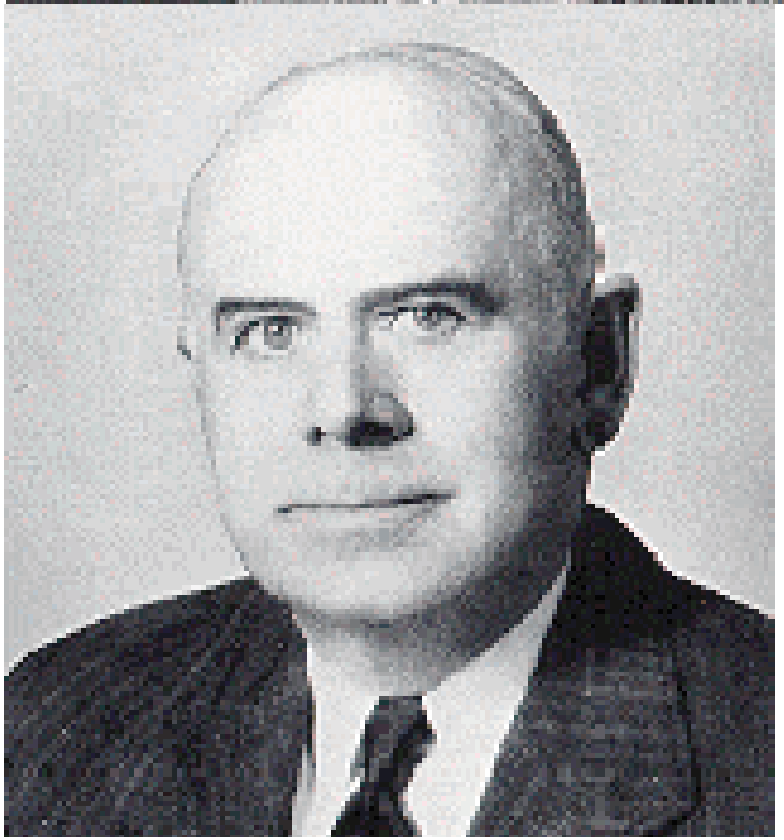
***The New York Times*, February 7th 1938**

RE: in early February 1938, before introducing the bill, Senator Bulkley met with President Roosevelt. The NYT described the meeting in a front page article (excerpted above).

"…It is well established that between 80 and 85 percent of the total expenditure in the construction of highways goes to labor. It should also be borne in mind that in handling the Federal funds for roads the State highway departments have, in cooperation with the Bureau of Public Roads, required the contractors to take, whenever possible, the employees for their work from the unemployment rolls. Between 85 and 90 percent of the people hired for these purposes are taken from the rolls of the unemployed…."

***The House Committee on Roads,* 1938**

RE: though Congress reduced the authorized funding for the *Federal Highway Act of 1938*, the principles of the legislation remained intact. Road building not only meant better roads, it also meant jobs; labor-intensive jobs at that, thereby helping solve the problem of chronic unemployment during a worldwide depression.



<u>Top Left</u>: caption: "Construction of the Blue Ridge Parkway in Virginia and North Carolina began in 1935. This section of the Parkway is near Floyd, VA."

<u>Top Right</u>: caption: "The first construction contract for the Natchez Trace Parkway in Mississippi was awarded in 1937."

<u>Left</u>: caption: "Thomas H. MacDonald headed the Bureau of Public Roads for 34 years, from 1919 to 1943, guiding the federal highway program from an era of mostly dirt roads to the beginning of the interstate highway era." 146

Part 3

I Have Seen the Future

The Superhighway of Tomorrow

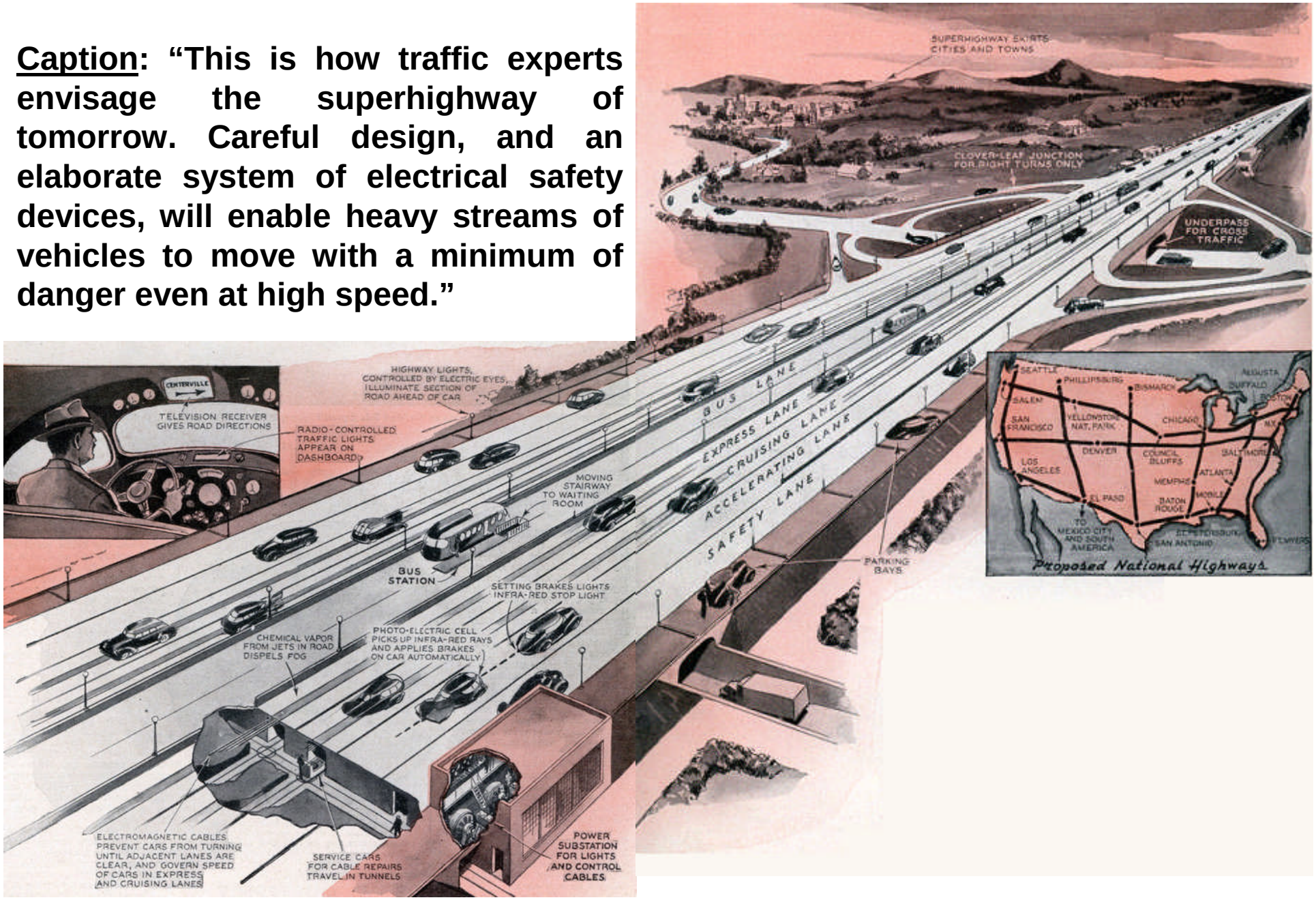
"…What will transcontinental touring be like, say, fifty years from now? Recently Dr. Miller McClintock, director of the Harvard University Bureau for Street Traffic Research - the man who is recognized as the nation's foremost authority on traffic problems - gave a startling preview of the momentous changes he sees ahead. Rear-end collisions, he foresees, will be made impossible by a new expedient. Pushing down the brake pedal on a car of the future will operate a stop light that emits infra-red rays. These invisible light rays, picked up and distinguished from ordinary light by a photo-electric cell on the front of a following car, will energize an electric circuit and apply its brakes automatically. Electric cables, buried beneath the pavements of superhighways, will govern the movement of cars. One set of electromagnetic impulses will control the car's speed. Another set will lock its steering gear against any attempt to make a dangerous turn from one lane to another. Eventually, the cable system may even be adapted to take over steering altogether - allowing the driver to release the wheel, sit back, and make himself comfortable until he chooses to switch back again to manual control. At night, the superhighways will light up of their own accord, section by section, as a car travels over them. 'Electric eyes' spaced along the road will turn on the glare-less illumination whenever a car passes, shutting it off at other times to conserve electricity..."

***Popular Science,* May 1938**

"…Imagine a typical section of this superhighway of the future. Straight as a shaft of light, ten or more broad lanes of concrete stretch across the countryside, passing around cities and towns, bridging railroads, canals, and crossroads. Streamline busses roar along a center strip that splits the speedway, separating streams of private cars traveling in both directions. For cars moving at different speeds, each one-way pavement is divided into separate safety, accelerating, cruising, and express lanes…"

***Popular Science,* May 1938**

Caption: "This is how traffic experts envisage the superhighway of tomorrow. Careful design, and an elaborate system of electrical safety devices, will enable heavy streams of vehicles to move with a minimum of danger even at high speed."



"…Hop into a 1988-model car and take an imaginary spin down one of these amazing foolproof roads. Perhaps you arrived at the transcontinental artery by plane, swooping down on one of the concrete flight strips lining the boulevard, or settling to an automatic, radio-controlled landing on a spacious airport built close to a major highway intersection. Driving up the cloverleaf approach onto the elevated highway, you glide first into the slow-speed safety lane, edge over into the accelerating strip, and turn the steering wheel to swing into the cruising lane. But nothing happens. Your car refuses to respond to the wheel, and suddenly you learn why as another automobile whips by on your left at sixty miles an hour. Suspended in service tunnels below the pavement, cables operating on an electromagnetic principle control a mechanism attached to the steering gear to prevent the car from turning left until the adjacent cruising lane is free from traffic for a safe distance…"

***Popular Science,* May 1938**

<u>Above</u>: caption: "Cloverleaf intersection, like this one on the West Side Express Highway in New York City, will be a feature of tomorrow's highways"

"…You try the wheel again. This time the car swings over into the cruising lane and immediately picks up speed. You haven't stepped on the gas, but the speedometer needle creeps steadily upward and freezes on the sixty mark. A second set of buried electromagnetic cables is taking over control of your speed, since cars in the cruising lane must go no more and no less than sixty miles an hour. But other automobiles are still flying past you on the express lane to your left. Now you swing the wheel over, confident that the car will respond only if turning is safe. In the express lane, your speed automatically steps up to the 100-mile-an-hour limit. Fifty yards of special nonskid pavement flies by underneath your car every second. Unless you switch back to a slower lane, you can maintain that pace hour after hour, for you'll never see a traffic light, a railroad crossing, a street intersection, or even a curve sharp enough to slow you down. At twilight, overhead lamps will bathe the road in light. Sleet cannot form on the chemically coated windshield of the car. If you run into fog, chemical vapor escaping from tiny jets in the roadway will clear a lane of visibility. So your top speed of 100 miles an hour is also your average speed - fast enough to let you have breakfast in New York, lunch in Ohio, dinner in Iowa, and a midnight snack not far from the Colorado state line…"

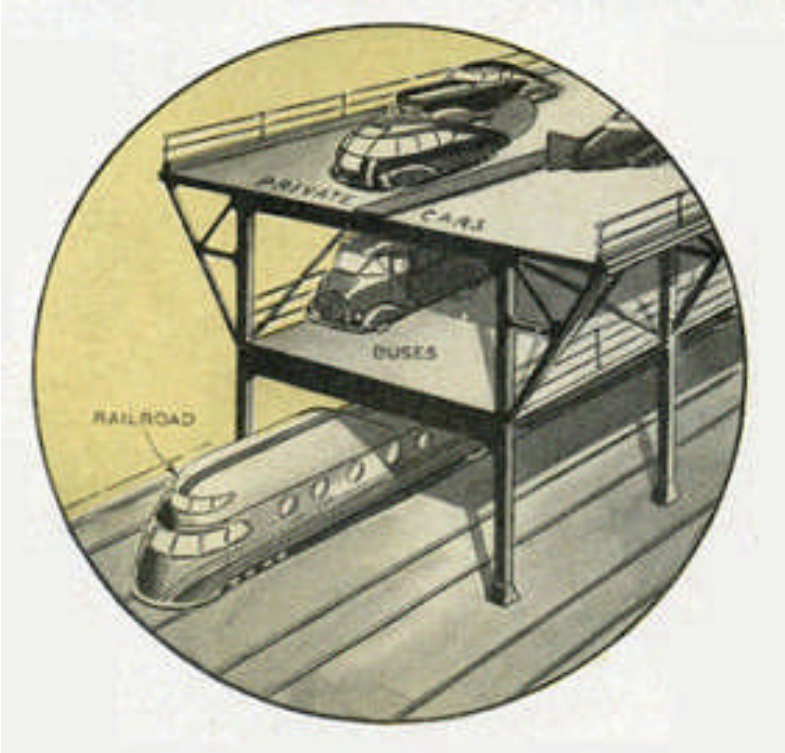
***Popular Science,* May 1938**

"…As your car eats up the miles in the express lane, you notice on your left a steel barrier that divides you from the broad two-way center lane reserved for express bus traffic. Built into the middle of this bus roadway at the outskirts of cities and towns, and at railroad and route junctions, are station platforms, served by moving stairways from waiting rooms below. Here passengers change from interstate busses to local lines to be whisked into cities and towns adjacent to the main highway. Still farther to the left, traffic is speeding along at a controlled pace in the duplicate one-way road section for cars traveling in the opposite direction. But as you marvel at the efficient handling, safety, and speed of this 1988 traffic, it suddenly dawns on you that this superhighway has no roadside markers, no painted warnings on the pavement, not even a signpost to direct you along the route. You search in vain for any of the familiar signs that in 1938 were almost as much a part of the highway as the paving – 'Sharp Curve,' 'Winding Road,' 'Steep Hill' - these signs, and the necessity for them, have disappeared from main routes years ago…"
***Popular Science,* May 1938**

How Will I Know?

"…'But how do I find my way around?' you ask your guide. 'How do I know where to turn off for Middletown or Centerville? Is every motorist a mind reader these days?' Your guide smiles and suggests that you swing off the traveled lanes and nose into one of the parking bays that line the shoulder of the road. 'Take a look at that dashboard,' he advises as you pull up to a stop out of the stream of traffic. At first glance you spot a few of the familiar dials and instruments - speedometer, fuel gauge, ammeter. After a little study you figure out a few of the others - tachometer, tire-pressure gauge, engine-temperature meter. But what is that row of colored lights, and what is that white screen just over the windshield? 'Since the old days when all cars had gear-shifts and burned gasoline for fuel,' he explains, 'science has stripped the welter of directional and warning signs off the highway and put the essential ones right on the dashboard of each car. At 100 miles an hour, roadside markers would be no more legible than hen tracks, anyway.' The law now requires every automobile to be equipped with standard, pre-tuned, ultra-short-wave radio and television units. On small four-lane side roads, traffic signals are indicated by the colored lights here on the panel. 'Miles before you reach any superhighway junction,' your guide continues, 'your television set picks up the junction transmitter. All you have to do is glance at the viewing screen to find out where the crossroads will take you and how far it is to the next turn-off. And in case you get confused somehow, it's simply a matter of throwing that switch lever to put you in two-way radio communication with highway-patrol headquarters. They'll tell you where you are, how far it is in hours and minutes to your destination, and where to make the correct turn off the highway.'…"

***Popular Science,* May 1938**



"…In congested areas, you find out, highways are built on elevated structures over railroad lines. The top deck is reserved for private cars, while busses run on a lower level, and streamline trains race along on the tracks beneath. Train passengers transfer at metropolitan terminals to bus platforms for transportation to local stations in city suburbs and villages…"

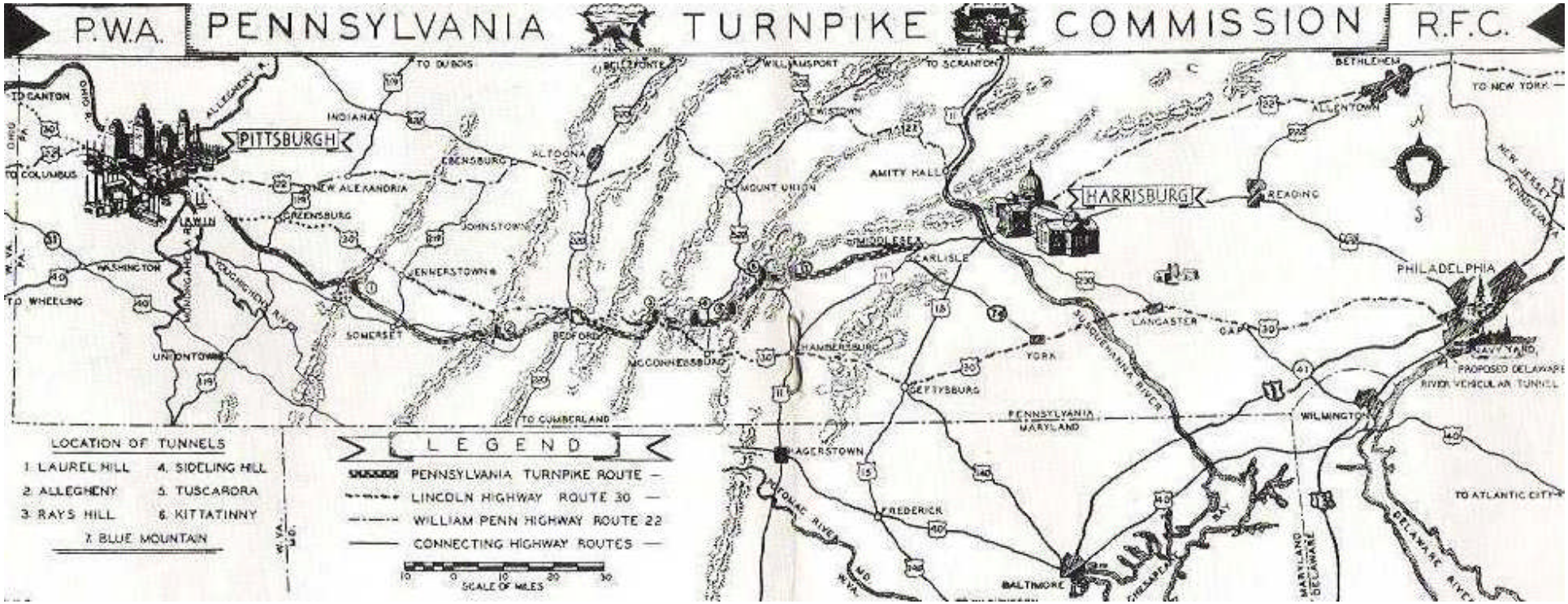
***Popular Science,* May 1938**

Left: caption: "In congested areas, double-deck roadways with separate levels for commercial and pleasure cars may be built over railroads"

"…Traffic experts realize that a superhighway similar to the one just described must eventually be constructed - not only to handle an ever-increasing volume of vehicular traffic, but also to end the highway slaughter that in the last fifteen years has taken almost twice as many lives as the total lost in all the wars the United States has fought since the founding of the Republic. Accident statistics show that in many cases the driver is at fault, but the great majority of crashes can be traced ultimately to the roads over which we drive. Better, safer highways are a vital necessity, and extensive road-development programs, now being pushed by state as well as Federal authorities, may lead toward the high-speed superhighways of the future. Already the State of Pennsylvania is pointing the way by authorizing the construction of what has been called the greatest road engineering project ever undertaken in the United States - a 164-mile, $80,000,000 toll boulevard stretching through the Allegheny Mountains from Harrisburg to Pittsburgh…."

***Popular Science,* May 1938**

America’s First Superhighway



"…The proposed route will follow a $10,000,000 railroad right of way, hacked out of the forests in the 1880's, and on which not one length of track has ever been laid. Built during a bitter feud between rival railroad interests, and abandoned after they concluded a truce, the unused roadbed runs through nine rock tunnels along its route for a total tunnel length of more than seven miles. Engineers' reports indicate the startling advantages the toll road will have over present traffic routes through the mountains and suggest some of the features that may be expected in future superhighways. From Harrisburg west to Pittsburgh, cars now have to climb nine-percent grades for a total of 13,880-feet. Over the new boulevard, cars will ascend a total of only 3,940-feet up grades that never exceed three percent. The route will eliminate four railroad and twenty-six highway grade crossings. Three quarters of its length will be entirely free from curves. On one straightaway, motorists will drive for forty miles without meeting a single bend in the road…"

***Popular Science,* May 1938**

<u>Above</u>: caption: "Carving Out a Section of Roadbed for the Pennsylvania Turnpike, 1939"

<u>Left</u>: caption: "The Tuscarora Tunnel was one of six uncompleted 19th century tunnels used to build the PA turnpike"

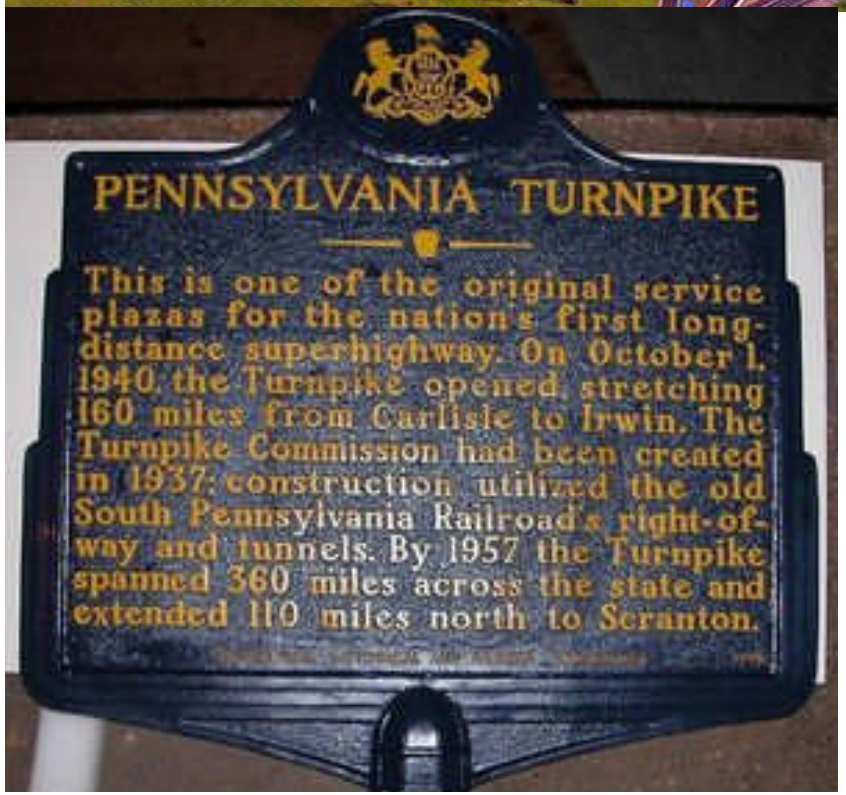
The *Pennsylvania Turnpike* (PT) would include:

• 160 miles of four-lane, all concrete highway from *Middlesex,* in *Cumberland County* (15 miles west of *Harrisburg*) to *Irwin,* in *Westmoreland County* (20 miles east of *Pittsburgh*);

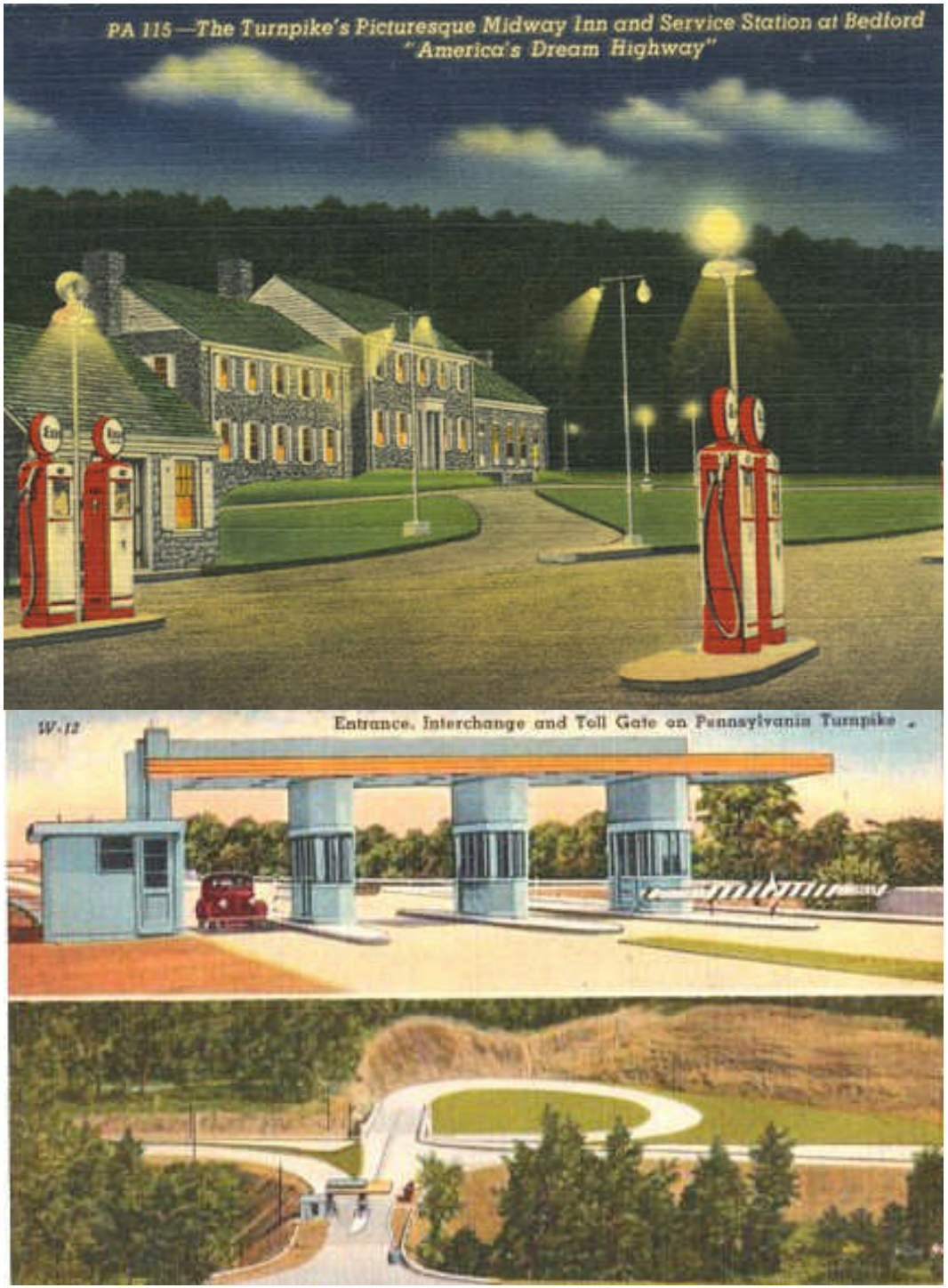
• Seven two-lane tunnels totaling 6.7 miles in length (six were former *South Pennsylvania RR* (SPRR) tunnels. Two other former SPRR tunnels were bypassed with open cuts;

• Eleven interchanges with toll booths;

• Ten service plazas, located 25 to 30 miles apart where the traveler could eat and/or purchase gasoline. Following the example of the *Autobahn*, the PT planners used regional architecture in the form of early PA stone houses for the service plazas. *Standard Oil of Pennsylvania* operated the gas stations while *Howard Johnson's* operated the dining areas and gift shops.



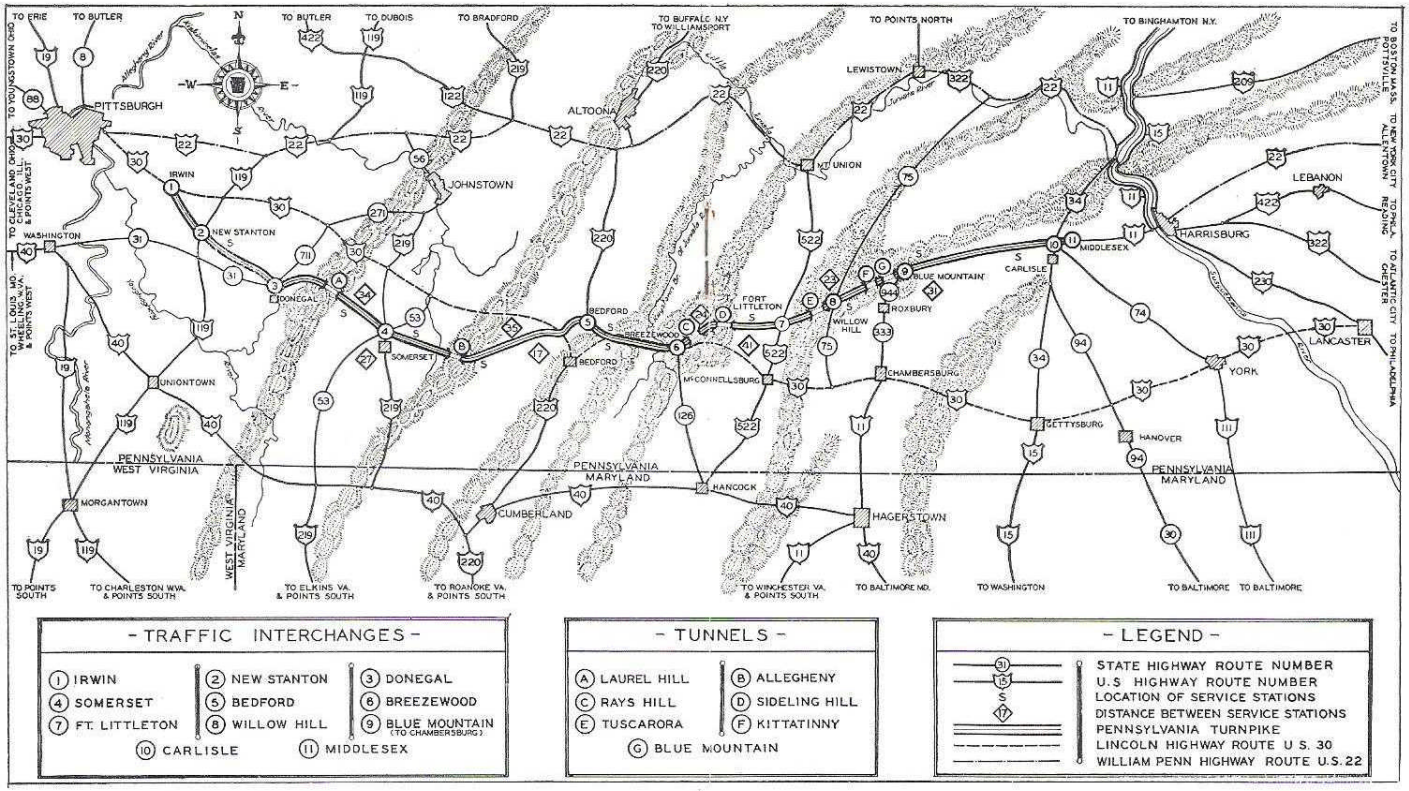
<u>Top Left</u>: *Sideling Hill* Service Plaza (present day)
<u>Top Right</u>: *New Stanton* Service Plaza (ca. 1941)
<u>Left</u>: Historic Route Marker (at service area)


PA 115—The Turnpike's Picturesque Midway Inn and Service Station at Bedford
"America's Dream Highway"
W-12
Entrance, Interchange and Toll Gate on Pennsylvania Turnpike

"The Pennsylvania Turnpike will meet one of the country's greatest needs – safe and rapid motor transportation through the Appalachian Mountains. Furthermore, actual savings in money will be made possible for all who use it. And money savings naturally appeal to owners and operators of motor cars. This is primarily significant in the operation and maintenance of trucks. On the present highways it is sometimes necessary to transfer heavy freight loads to specially equipped high-powered trucks for the trip over the mountains. Much of the trip also must be made in second or low gear. On the Turnpike, however, the heaviest modern truck will travel the entire 160 miles in high gear. Seventy trucking companies interviewed by the Commission's Traffic Engineers agreed that substantial monetary savings will result from the Turnpike in the following particulars:

- ***Safe operation at higher speeds in all kinds of weather;***
- ***Reduced fuel cost;***
- ***Reduced tire cost (because of lower grades and reduced breaking effort);***
- ***Reduced maintenance cost (because of lower grades and reduced curves, with resulting lessening of strain on transmission, brakes and engine);***
- ***Utilization of lower powered trucks for the same payload and of increased payload for present size of unit;***
- ***Saving of time ranging from two to six hours per trip between Harrisburg and Pittsburgh;***
- ***Reduction of accidents with corresponding saving in insurance rates;***
- ***Trucks and other slow moving vehicles will use the outside lane***

***Pennsylvania Turnpike Commission* (1940)**



FARE SCHEDULE

Vehicle Type: PASSENGER CARS

LIGHT TRUCKS
Allowable Gross Weight: Up to 7,000 lbs.
Penna. License Class: R, S
Full Length Fare: $1.50
Full Length Round Trip Fare for Passenger Cars Without Trailers: $2.25

INTERCHANGE	Irwin	New Stanton	Donegal	Somerset	Bedford	Breezewood	Ft. Littleton	Willow Hill	Blue Mt.	Carlisle
NEW STANTON	.10									
DONEGAL	.25	.15								
SOMERSET	.40	.35	.20							
BEDFORD	.75	.70	.55	35						
BREEZEWOOD	.90	.85	.70	.50	.15					
FT. LITTLETON	1.10	1.05	.90	.70	.35	.20				
WILLOW HILL	1.20	1.15	1.00	.80	.50	.35	.15			
BLUE MT.	1.30	1.25	1.10	.90	.60	.45	.25	.10		
CARLISLE	1.50	1.45	1.30	1.10	.80	.65	.45	.30	.20	
MIDDLESEX	1.50	1.45	1.30	1.15	.85	.70	.50	.35	.25	.10

CLASS 2

VEHICLE TYPE	ALLOWABLE GROSS WEIGHT	PA. LICENSE CLASS	FULL LENGTH FARE*
Medium Trucks	7,000–15,000 lbs.	T, U, RZ, SZ	$3.00
Heavy Trucks	15,001–19,000 lbs.	V, TZ	$4.00
Heavy Trucks	19,001–24,000 lbs.	W, UZ	$4.50
Heavy Trucks	24,001–30,000 lbs.	Y, Z, VZ	$5.00
Heavy Trucks and Tractor Trucks with Semi-Trailers	30,001–32,000 lbs.	WZ	$6.00
Heavy Trucks and Tractor Trucks with Semi-Trailers	32,001–45,000 lbs.	YZ, ZZ	$7.50
Trucks and Full Trailers	45,001–62,000 lbs.	(No Letters)	$10.00

*Truck Fares for all intermediate points is on a mileage basis.

For Further Information Write the Pennsylvania Turnpike Commission, Harrisburg, Pa.

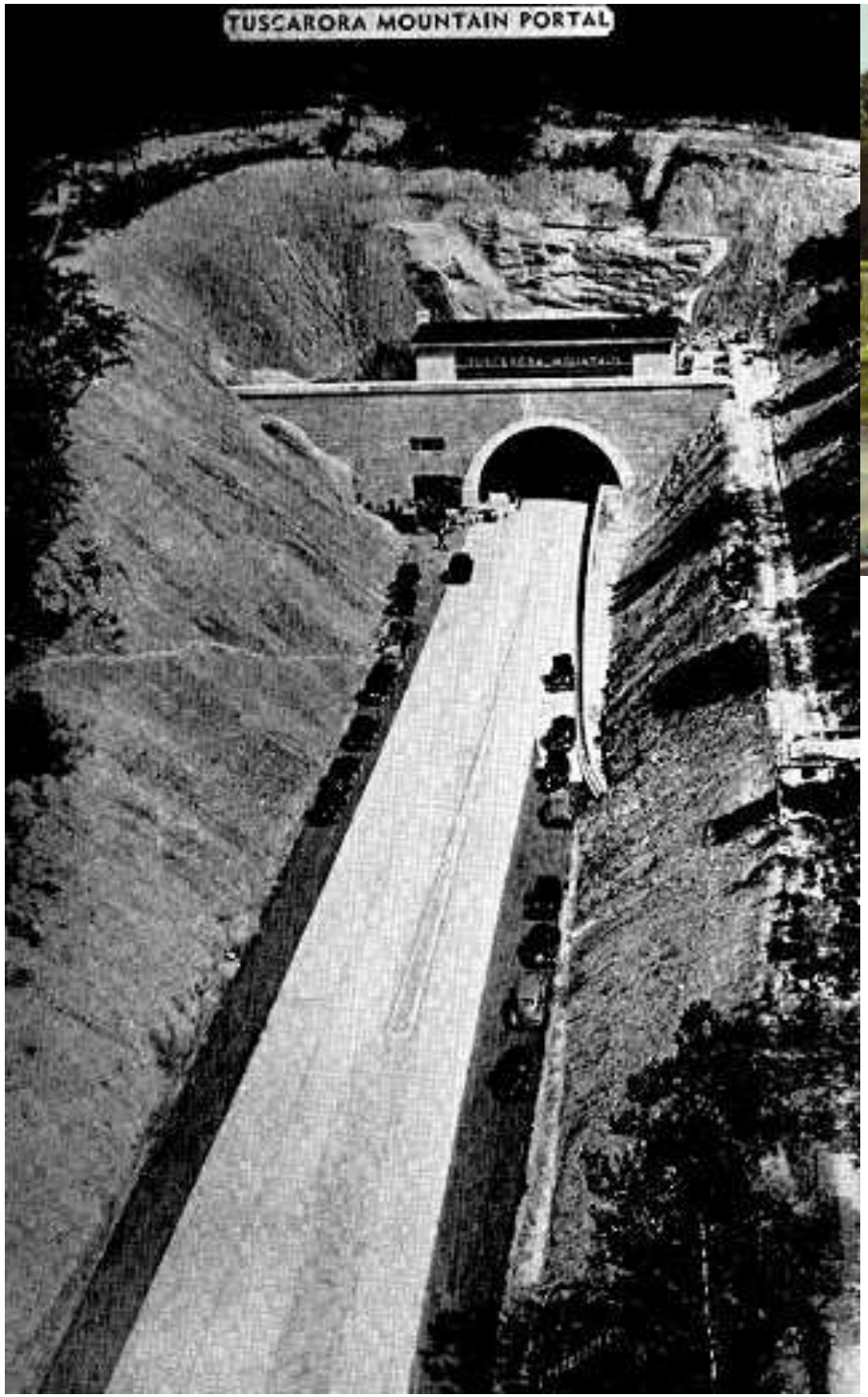
"…While there will be some monetary savings in the operation of passenger cars, the principal reason why such motorists will use the Turnpike is because of the added convenience, safety and comfort as well as saving in time. The Turnpike will eliminate 90 percent of all causes of accidents – no head-on collisions, no side-swiping, no grade crossings or intersections, no striking of pedestrians or stationary objects along the right-of-way. Hazards of snow, ice and fog now found on roads over the mountains at nearly all seasons of the year are practically eliminated on the superhighway. The Turnpike is above flood levels, thus insuring access to and from Pittsburgh in event of recurrence of disastrous floods."

***Pennsylvania Turnpike Commission* (1940)**

RE: the *Pennsylvania Turnpike* officially opened on October 1st 1940. Highway engineers had always designed highways with flat curves to discourage speeding. For the PT, long sweeping curves provided ample room for high speeds and safe stopping distances. Easy grades would also allow year-round use of the PT. Design standards included:

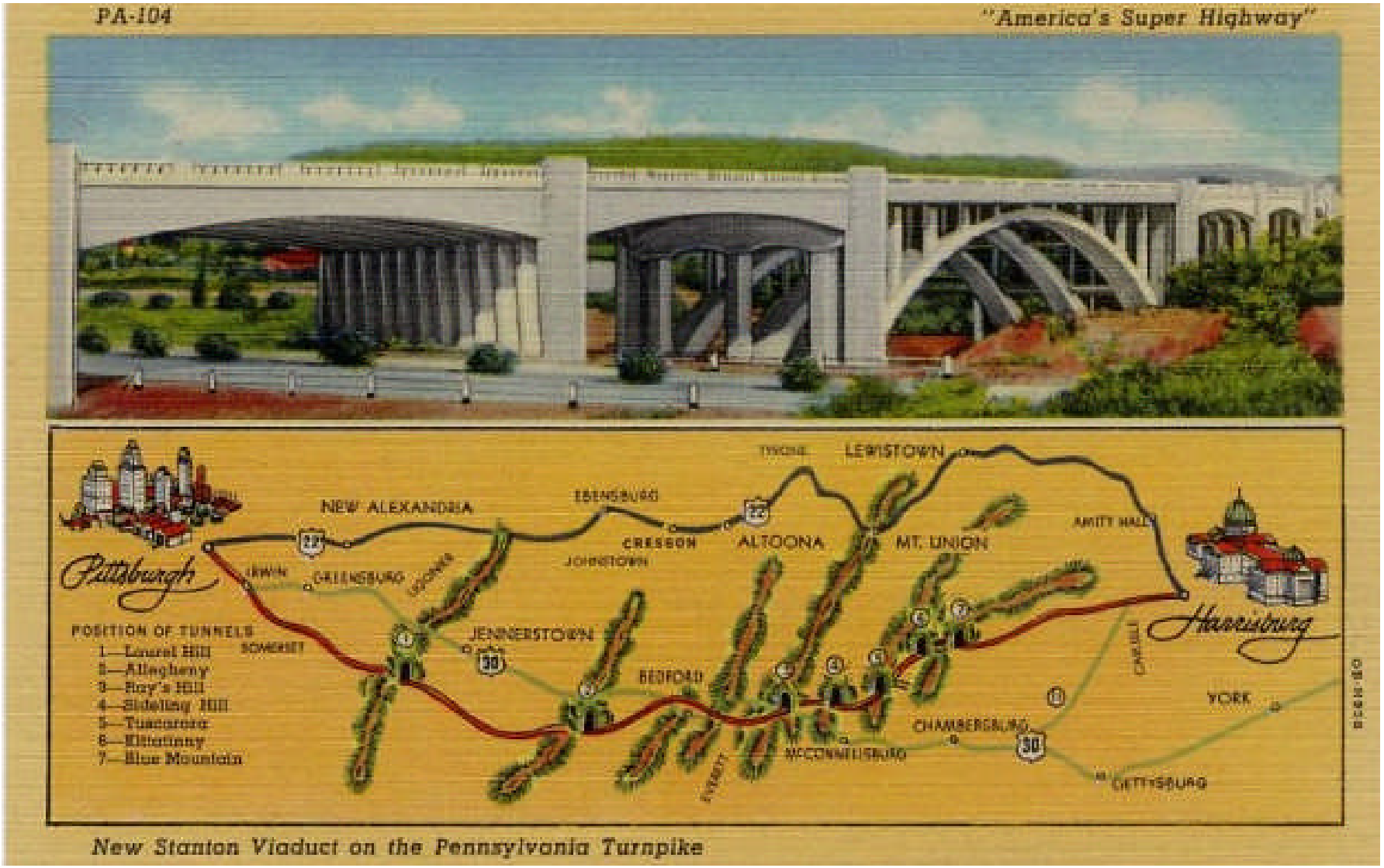
- **A right-of-way width of 200-feet;**
- **A four-lane divided configuration, with 12-foot wide concrete traffic lanes, a 10-foot wide median strip and ten-foot wide shoulders;**
- **A maximum grade of 3% (3-feet of climb for every 100-feet of forward travel). By comparison, on the old two-lane *William Penn* (US 22) and *Lincoln Highway* (US 30), hills as steep as 9% to 12% were encountered;**
- **A maximum curvature of six-degrees, most of which occurred on the climb from *New Baltimore* to the *Allegheny Tunnel* (most curves were 3% to 4%);**
- **Substantial "Superelevation" (banking) on curves;**
- **Limited access, with 1,200-foot-long entrance and exit ramps;**
- **A Minimum 600-foot sight distance from motorist to traffic ahead;**
- **All vehicular and/or pedestrian traffic would travel under or over the PT**


Pennsylvania Turnpike and Lincoln Highway through the Narrows, West of Everett, Pa.
13



<u>Above</u>: caption: The PA turnpike immediately caught the public's imagination. Here cars pass through an original toll booth."
<u>Left</u>: caption: "Western Portal of Tuscarora Tunnel shortly before the opening of the Turnpike in 1940"

<u>Above L&R</u>: *Pennsylvania Turnpike Commission* (PTC) photo of the 1627-foot-long *Clarks Summit Bridge* (at *Scranton Interchange*). The PT featured seven mountain tunnels and 307 bridges.
<u>Left</u>: "Speed Limit 70 Miles" sign along the PT (ca. 1942)



<u>Above</u>: this ca. 1950 postcard shows the original seven *Pennsylvania Turnpike* tunnels. East-to-west (right-to-left) they were: *Laurel Hill*, *Allegheny*, *Rays Hill*, *Sideling Hill, Tuscarora, Kittatinny* and *Blue Mountain*. The *Laurel Hill Bypass* opened in 1964 and the *Rays-Sideling Hill Bypass* in 1968, the same year the dual bores for the remaining five tunnels were completed.

"Pennsylvania Turnpike, I love you so,
All the way from Jersey, to Oh-Hi-Oh.
Oh how I go for the beautiful mountains, and the fields of grass,
And the friendly road staff, where we even can get gas.
Pennsylvania Turnpike, how I love you,
And when I pay my toll fare, don't yer love me too.
Now I'm up in Somerset, and snow plowing ain't come yet,
Pennsylvania Turnpike, I'm stuck on you,
Oh, Pennsylvania Turnpike, how I love you,
And when I pay my toll fare, don't yer love me too…"
***George Vaughn Horton*, Country music composer/singer**

"…Ultimately, the Pennsylvania toll road may serve as one link in the transcontinental chain of highways proposed by Senator Bulkley and now being studied by a committee. This whole Federal network would also operate under a toll system, scaled to the rate of about one tenth of a cent a passenger mile, in addition to a flat fee of twenty-five cents for each car entering the highway. Thus you would pay a quarter to get on the boulevard at New York and ninety cents to drive the 900 miles to Chicago, if you were alone in the car. Federal police would man the toll gates and patrol the road. Since every car would be required to stop at toll stations, authorities could bar intoxicated drivers, check licenses, halt automobiles considered unsafe to drive, and enforce uniform traffic regulations - a procedure that might result in one nationwide code of traffic laws and regulations that would apply in every state in the Union. These road-building developments indicate that the superhighway of the future is definitely on the way. No one can predict exactly what it will be like, but experts are confident that a modern Rip Van Winkle would wake up twenty years from now rubbing his eyes in amazement at the sight of streamline cars racing along broad, divided highways of concrete with a speed and a margin of safety far beyond his wildest dreams."

***Popular Science,* May 1938**

Highways and Horizons

THE GENERAL MOTORS EXHIBIT BUILDING

1939

New York World's Fair

HIGHWAYS AND HORIZONS

A GREETING TO OUR GUESTS:

It is the hope of General Motors that the visitor to its HIGHWAYS AND HORIZONS exhibit at the New York World's Fair will be inspired with a greater realization of the fact that "the world of tomorrow" can be made an infinitely better place in which to live.

The FUTURAMA, highlight of the World's Fair, is designed, not as a projection of any particular highway plan or program, but rather to demonstrate in dramatic fashion that the world, far from being finished, is hardly yet begun; that the job of building the future is one which will demand our best energies, our most fruitful imagination; and that with it will come greater opportunities for all.

History shows that the progress of civilization has run parallel to advancement in transportation.

New communities, new enterprises and new opportunities have everywhere followed the development of new and better means for moving goods and people. But progress in transportation —the reduction of distance in terms of time and cost—is, in a larger sense, only a symbol of expanded horizons in every field of activity.

As an expression of this broader concept, General Motors hopes that its HIGHWAYS AND HORIZONS exhibit will serve as a constructive "investment in the future" for everyone, everywhere.

Sincerely,

Alfred P. Sloan, Jr.

Chairman

FOREWORD

The roads we travel today are the creation of little more than a score of years. In the same period motor vehicles have increased tenfold in numbers and immeasurably in utility. Together, the roads and motor vehicles, affording a new facility of transportation, already have wrought profound changes in our ways of life.

Yet the power of this new facility for social and economic gain is unfulfilled. Twenty years more will see a further vast improvement in the rural highways; and, in the streets of our cities, a beneficial alteration greater still. What, in the same period, will be added to motor vehicles in the quality and economy of their performance, may be surmised from the remarkable advances of recent years.

With vehicles and roads improved far beyond the common expectation of today, highway transport has yet to make its greatest and most characteristic contribution to the Nation. In Highways and Horizons, the General Motors Corporation helps us to foresee somewhat of the character and almost unlimited possibilities of that eventual contribution.

Thos. H. MacDonald

Chief, Bureau of Public Roads,
U. S. Department of Agriculture

IN presenting Highways and Horizons, a dramatization of future highway progress, General Motors does not seek to predict what the roads of the future will be. Rather it seeks to express the conviction that highway progress, directed by experienced and forward-looking highway officials, will be an even more important influence for national progress in the world of tomorrow than it has been heretofore. The best present knowledge and experience in traffic engineering and highway planning was utilized in the creation of Highways and Horizons. However, it was believed that to adhere too closely to the lines of any of the present highway engineering theories would be to sacrifice the main purpose of the entire project, which is to stimulate public interest and imagination. General Motors dedicates its exhibit to improvement in our streets and highways in the firm belief that to increase the avenues of transportation is not only to increase the broad economic service of the automobile industry itself but, more importantly, to enrich the lives of all the people.

GENERAL MOTORS HIGHWAYS AND HORIZONS

"A Fair within the Fair"

•

A. Main Entrance.

B. Map Lobby—Start of Sound-Chair Tour.

C. Touring Sound-Chairs on "Carry-Go-Round."

D. Animated Scale-Model "Futurama"—A Vast Cross-Section of America in Dramatic Terms of 1960.

E. Unloading Platform and Elevated Pedestrian Sidewalks on Full-Scale Future Street Intersection.

F. "World Horizons" Exhibit of General Motors Overseas Operations.

G. Frigidaire Division Display.

H. Exhibit of General Motors Research Laboratories.

I. Display of Inland Manufacturing Division.

J. A 4000 Horsepower Streamlined Diesel Locomotive Which Forms a Spectacular Entrance to the Building.

K. Traffic and Safety Information Center.

L. Stairways to Diesel Engine and Fisher Body Exhibits.

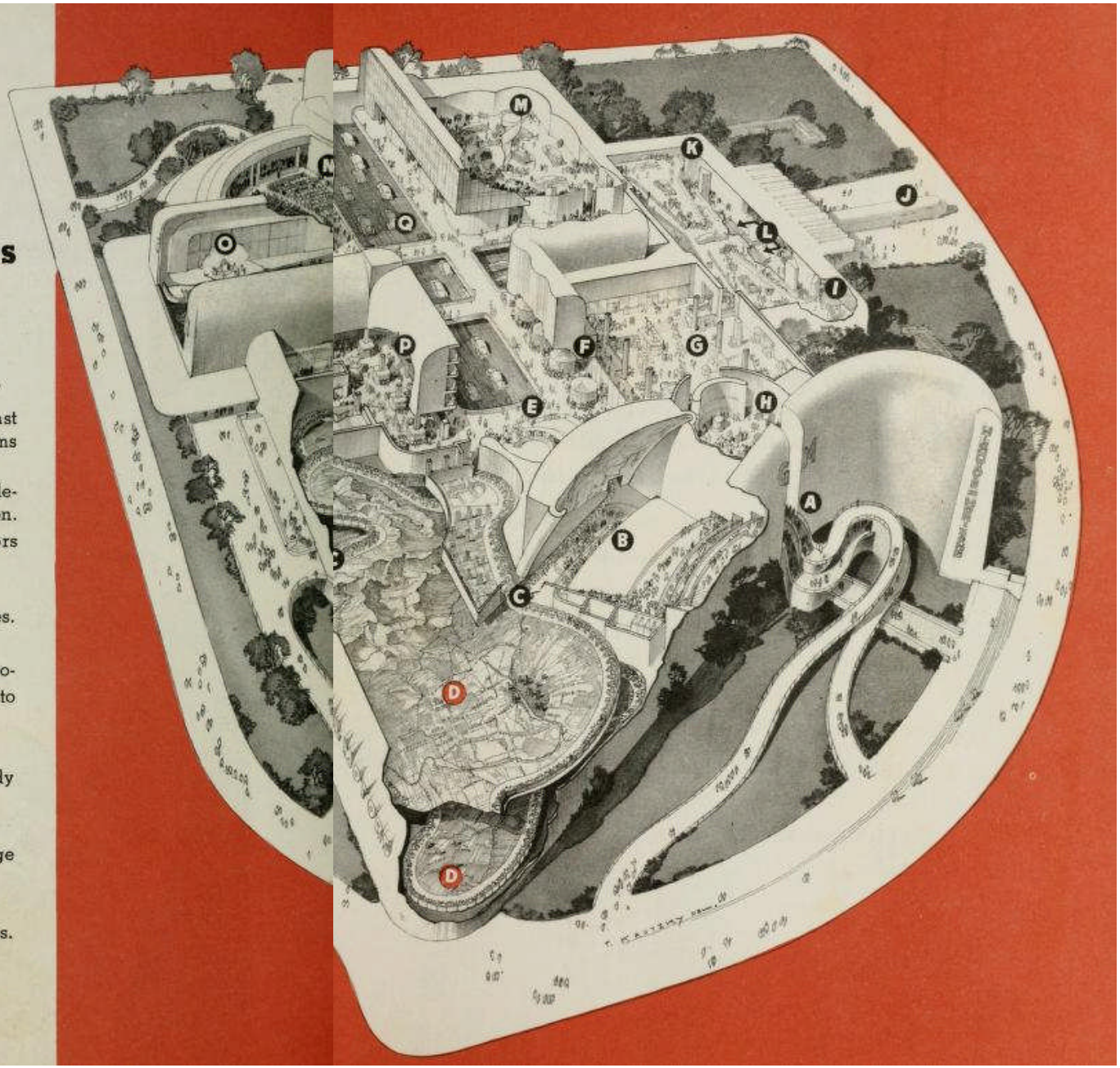
M. Car Display Salon.

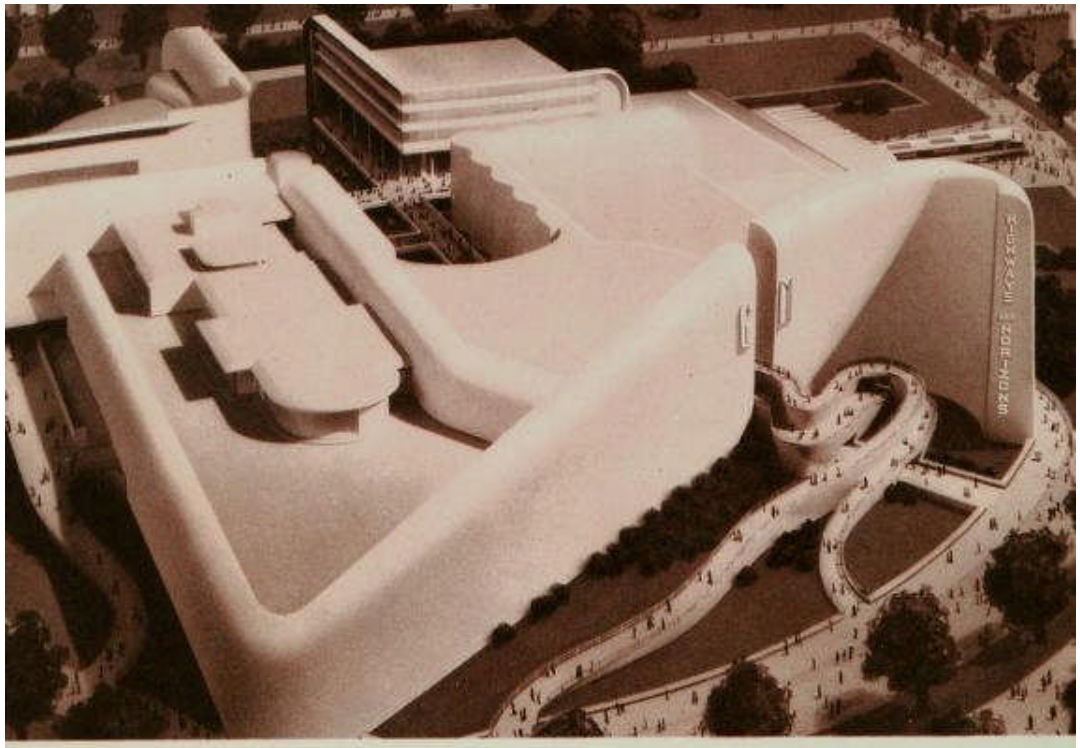
N. Casino of Science, in Which Is Presented a Stage Show of Science and Research.

O. General Motors Employe Headquarters.

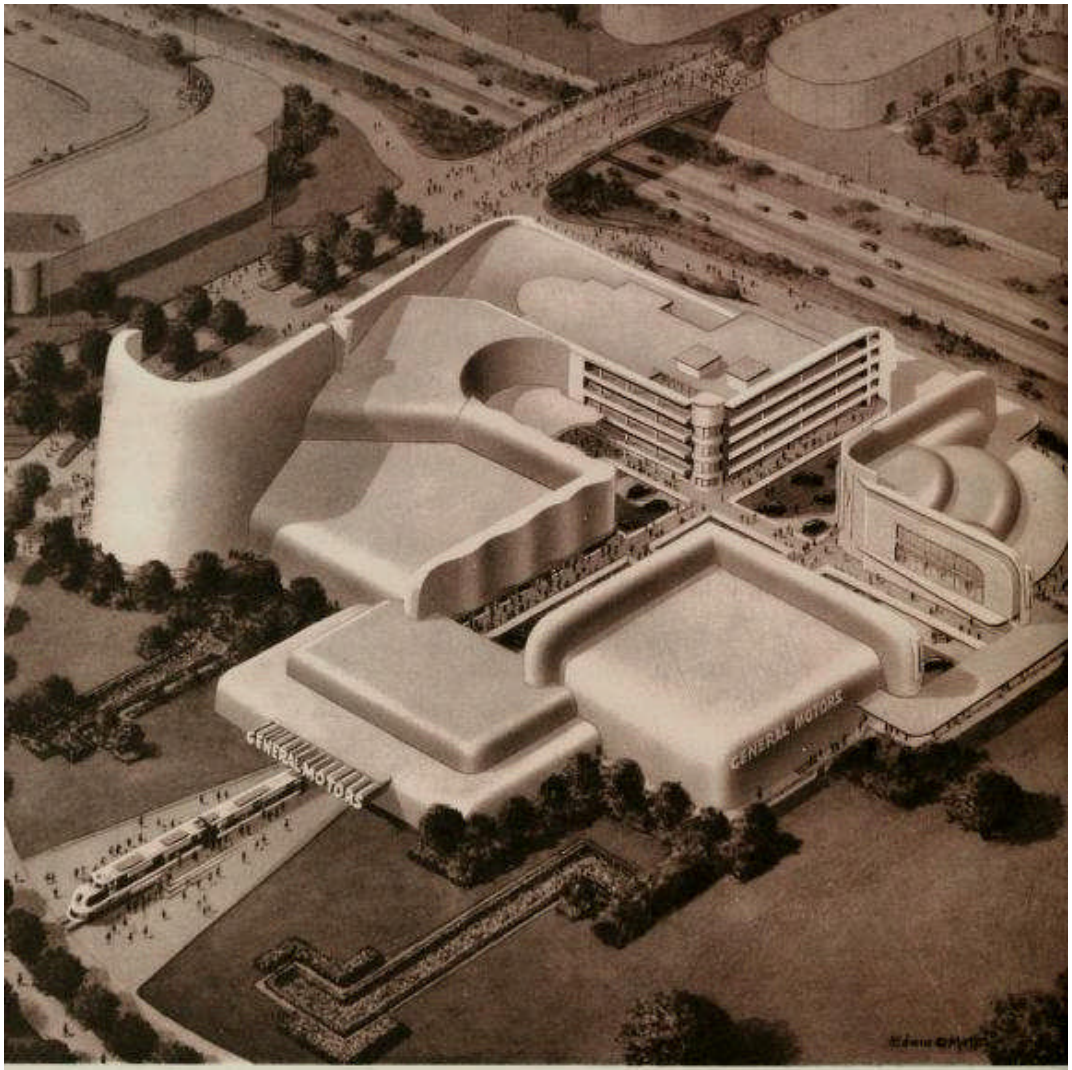
P. Exhibits of General Motors Accessory Divisions.

Q. Street Level of Intersection of the Future.



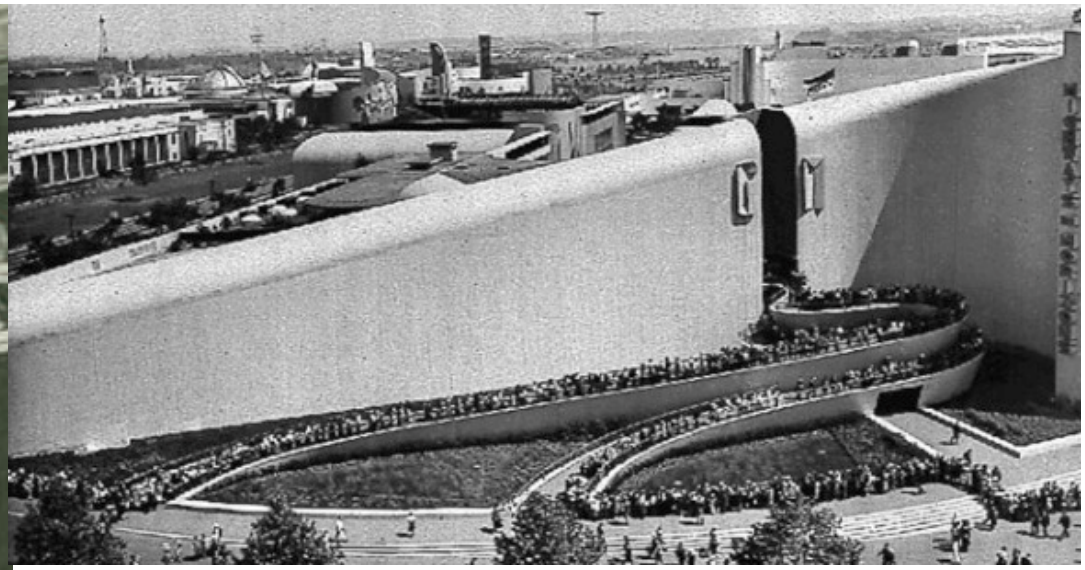


MOTOR transportation, now more than ever before, is related inseparably to the daily lives and progress of those it serves. To provoke intelligent public thought as to the practical problems of highway travel is the first purpose of Highways and Horizons. No effort has been spared in the creation of a magnificent exhibit, fascinating to see, but it is hoped that its real and lasting splendor will be found in the accomplishment of that first purpose.



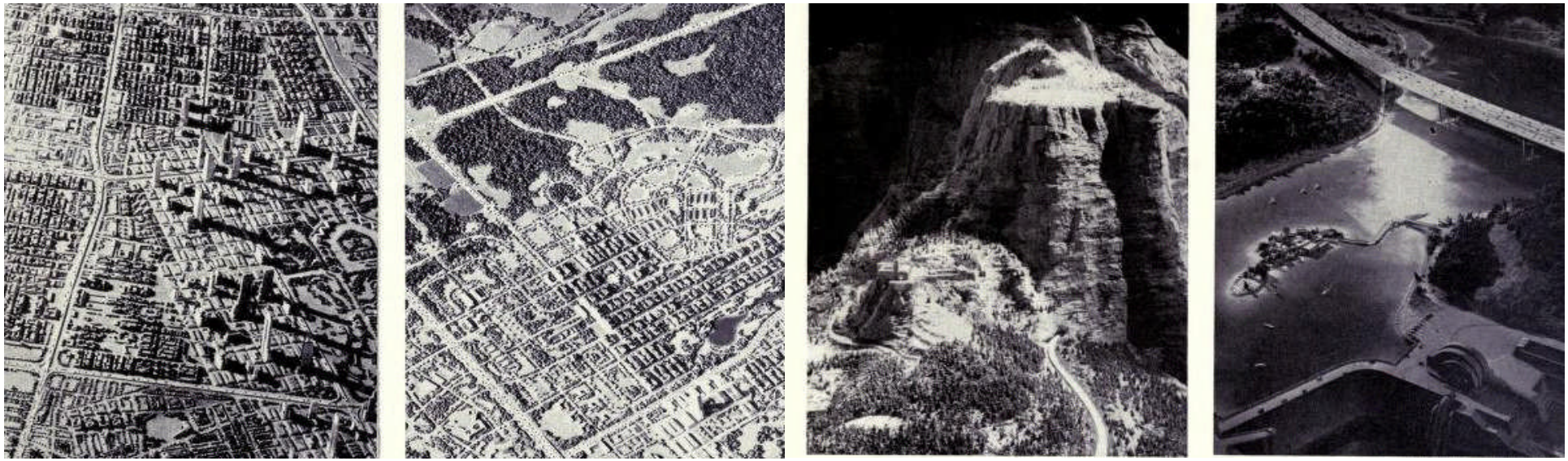
Designed by Norman Bel Geddes, the General Motors exhibit covers an area equal to two and one-half city blocks at the head of the Fair's Central Mall in the Transportation Zone. At its tallest point Highways and Horizons reaches 110 feet into the air, a striking example of futuristic beauty. Broad terraces circle its base and the landscaping is a contrasting pattern of deep green.


REVIEW



"Five million people saw the Futurama of the general Motors Highways and Horizons Exhibit at the New York World's Fair during the summer of 1939. In long queues that often stretched more than a mile, from 5,000 to 15,000 men, women and children at a time, stood, all day long every day, under the hot sun and in the rain, waiting more than an hour for their turn to get a sixteen-minute glimpse at the motorways of the world of tomorrow. There have been hit shows and sporting events in the past which had waiting lines for a few days, but never before had there been a line as long as this, renewing itself continuously, month after month, as there was every day of the fair…"

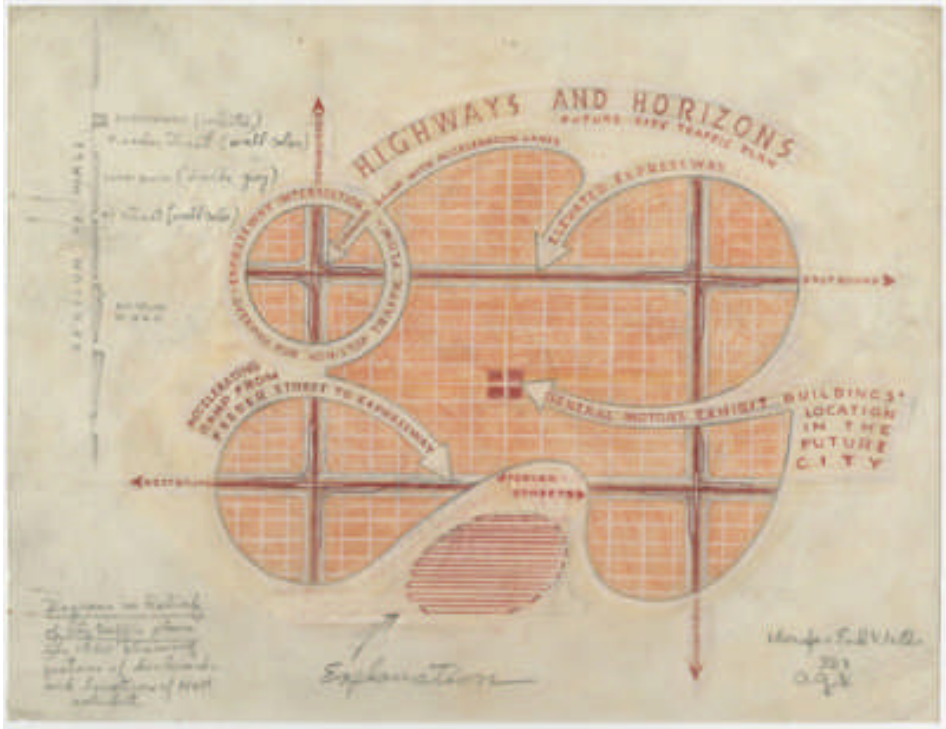
RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

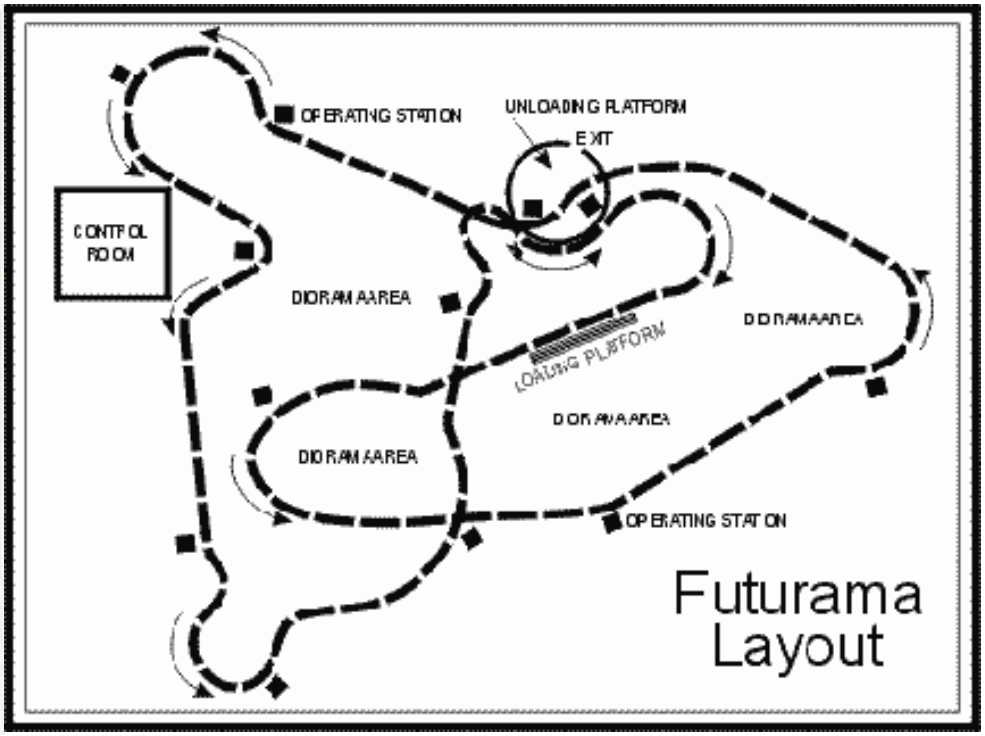


"…In designing the Futurama, we reproduced actual sections of the country – Wyoming, Pennsylvania, California, Missouri, New York, Idaho, Virginia – combining them into a continuous terrain. We Used actual American cities – St. Louis, Council Bluffs, Reading, New Bedford, Concord, Rutland, Omaha, Colorado Springs – projecting them twenty years ahead. And we of course took already existing highways into account, making use of their most advanced features and, at the same time, projecting them also twenty years ahead…"

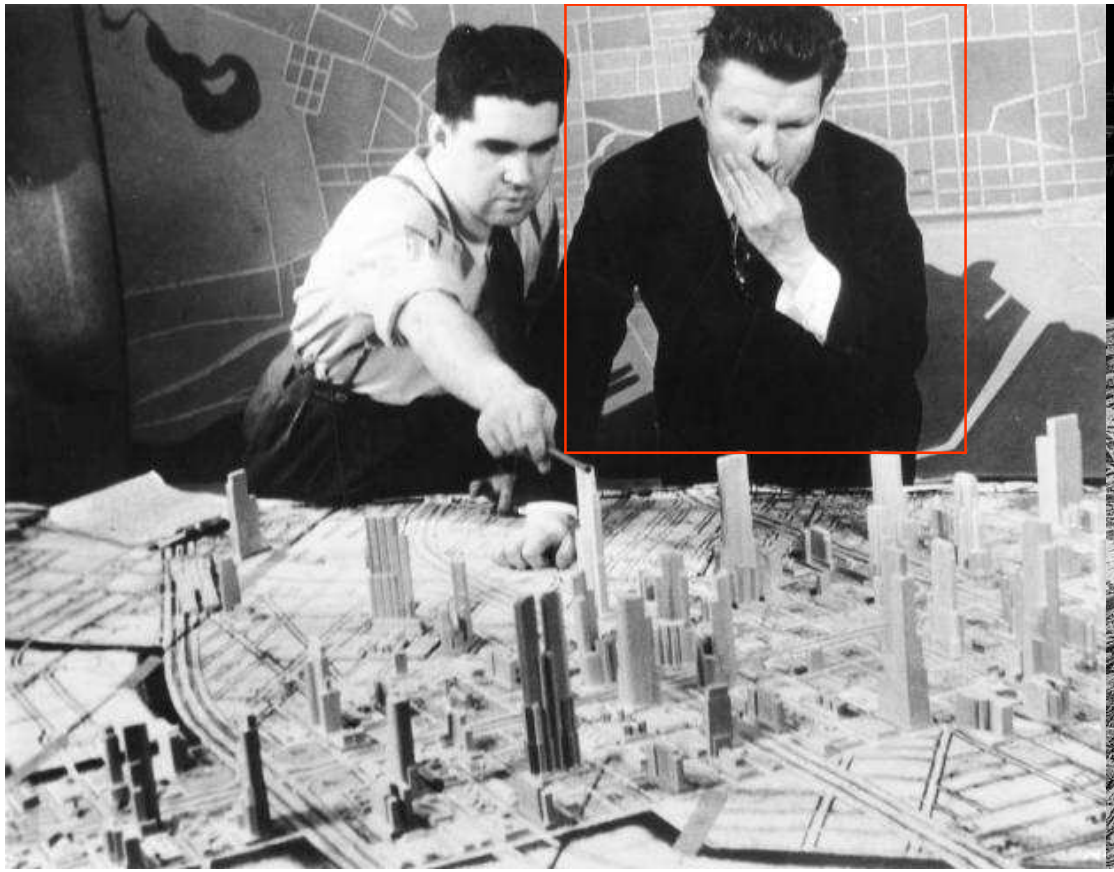
RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

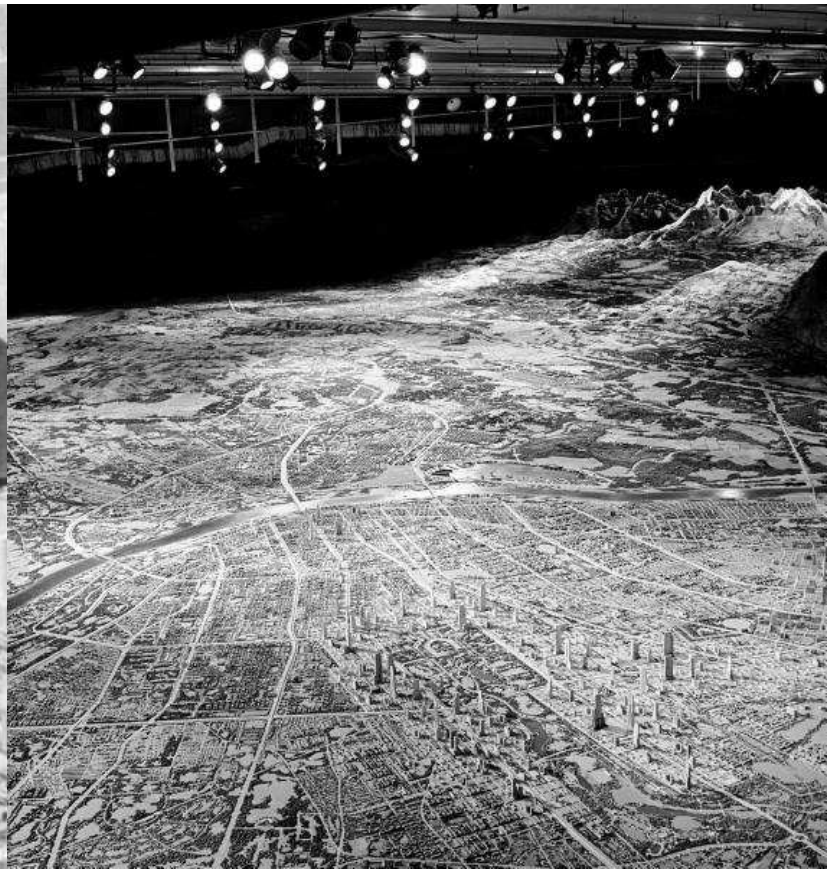
<u>Above (left-to-right):</u> caption: "Skirting Cities / Past Towns / Through Mountains / Spanning Rivers"





<u>Top Left</u>: caption: "Diagram in relief of city-traffic plan for 1960 showing features of boulevards and location of Highways & Horizons exhibit (ca. 1938)"
<u>Top Right</u>: Futurama Layout
<u>Left</u>: General Motors' Futurama entrance





"…Almost as big as a football field, the diorama is the largest of its kind ever built. There are 50,000 scale-model automobiles, 10,000 of them actually moving. A half million tiny building comprise its many cities and villages. Snow-covered mountains are crossed, and deep ravines explored…"

***Popular Science,* July 1939**

Left: designer *Norman Bel Geddes* (highlighted, at right) looks over a scale model city from the diorama

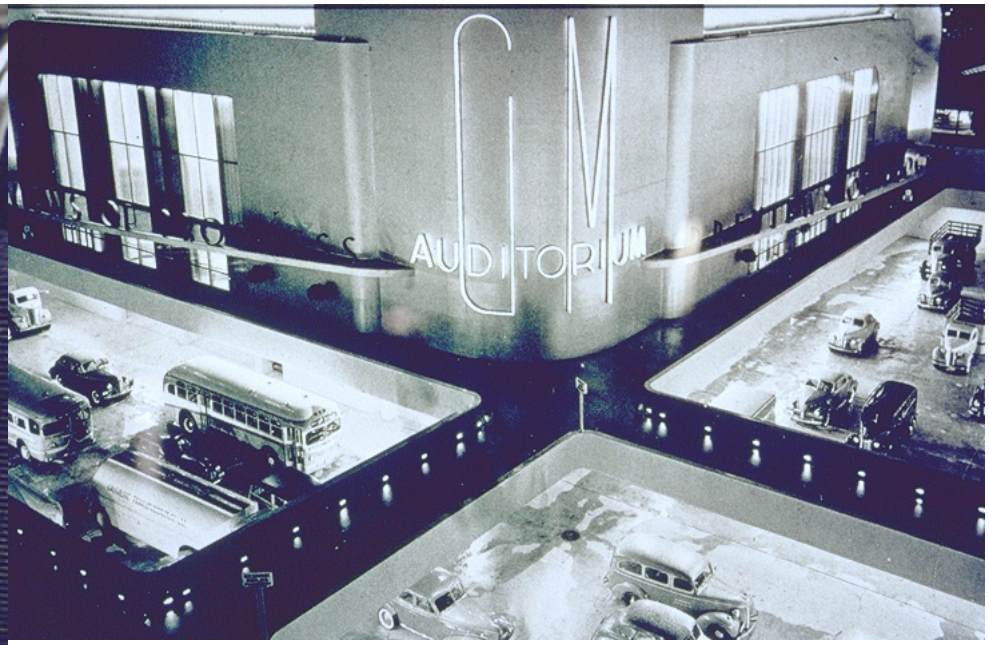
Right: overhead view of the diorama

"…There are few barriers left, and people, once days apart, are now within easy reach of one another. The future will see a still greater realization of this conquest of mankind over nature's distances. The necessity for a far-reaching and planned expansion of America's highway system is not due chiefly to the fact that the motor vehicle is already operating well below its capacity to serve. Getting in and out of, or passing through, a large city have long been a tremendous handicap to the efficiency of the motorcar. A few express, or super-arterial, highways have done something to bring about a better correlation between city and rural systems at their meeting point, and by-passes, or circumferential highways, have eliminated many delays to so-called through traffic…"

RE: excerpt from General Motor's "Highways and Horizons" brochure

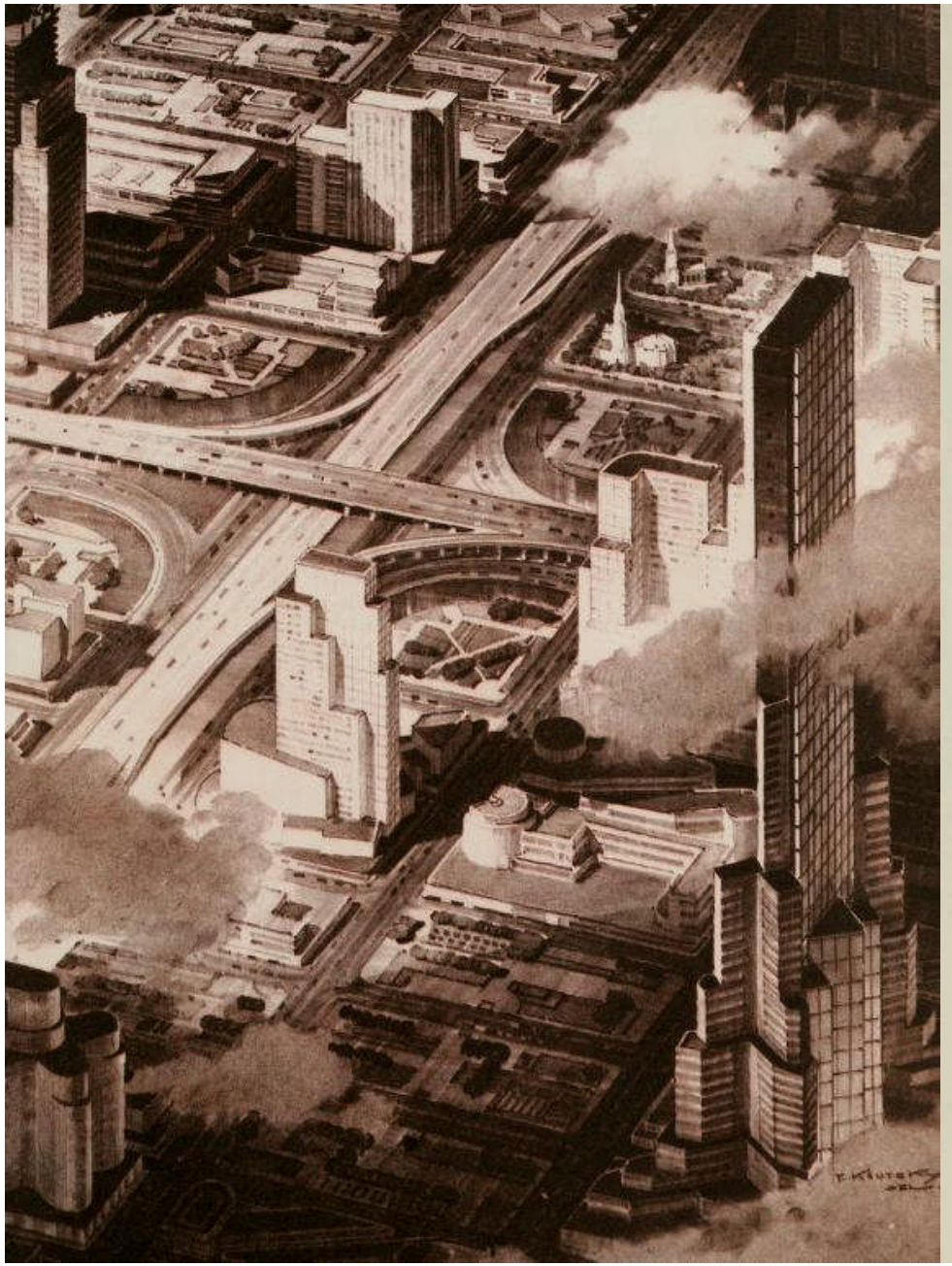
BEFORE the advent of the good roads movement less than a generation ago, the American farmer was an isolated individual, made remote from markets and the comforts of civilization by roads slow, difficult and costly to travel. We have seen in our time how the spread of hard surfaced highways has changed this—how it has brought conveniences to the farmer's door and his produce more readily to market.

● Progress itself begins and continues with the removal of natural barriers, and the history of any land is the history of its transportation. Less than three generations ago the roads of America were still in the Dark Ages of their development. Most of the country was still new and only trails reached out to the frontiers. There was rapid progress, but with the advent of the motorcar America was still short on roads for its horse-drawn vehicles. The job was one of building highways for the motorcar before roads had been finished for the horse. The last generation has seen most of this mighty undertaking accomplished.



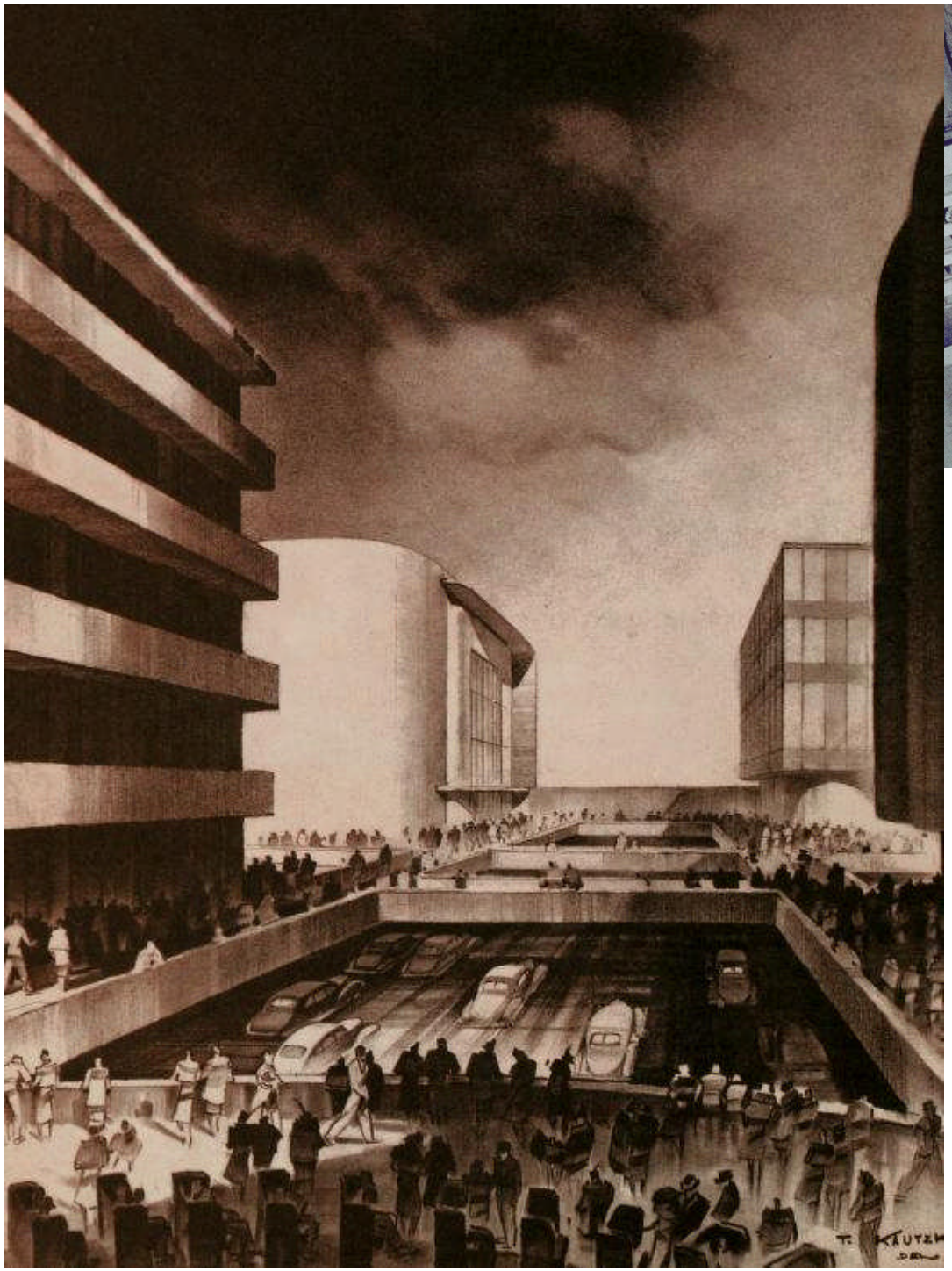
"…Imagine being suddenly transported twenty years into the future!...to the heart of a great city!...in the year 1960! This seems to happen to you as you stand in the City of the Future, heart of the General Motors exhibit building, Highways and Horizons. It IS 1960 – broad elevated sidewalks extend a full block in two directions, while below the city streets are filled with motor vehicles…wonders not of tomorrow, but of the world today…"

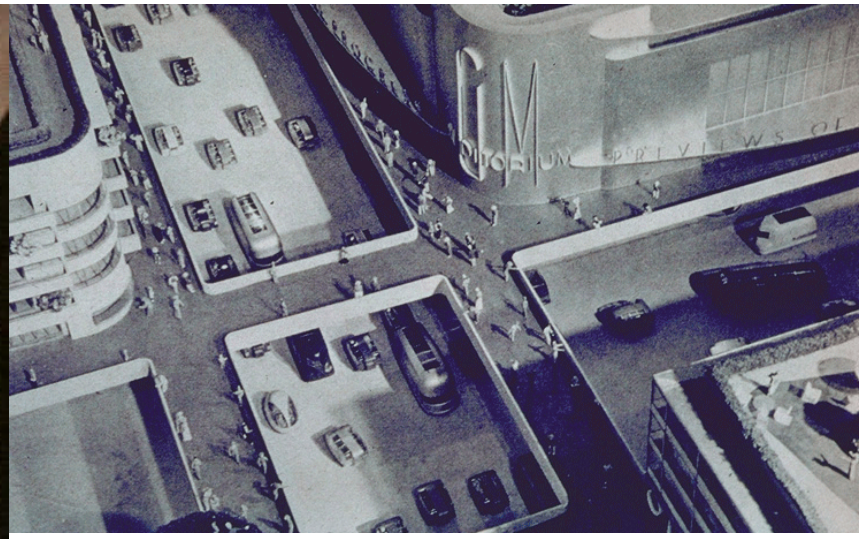
RE: excerpt from GM's "Highway's and Horizons" brochure



As every driver knows, there is still little pleasure in being at the wheel when entering or leaving large cities. No one thing will add more to the efficient use and joy of the motorcar than the correction of this condition—perhaps in some such fashion as here pictured.

The highway problem, then, is a street problem too, because streets are definite and important parts of the highway system. But the great cities of today were planned and largely built before the motor car was even a dream. The problem now is to correct existing conditions. Ultimate progress can only be made by creating new facilities which will diminish congestion until traffic, both vehicular and pedestrian, moves about with safety, convenience and comfort for all.



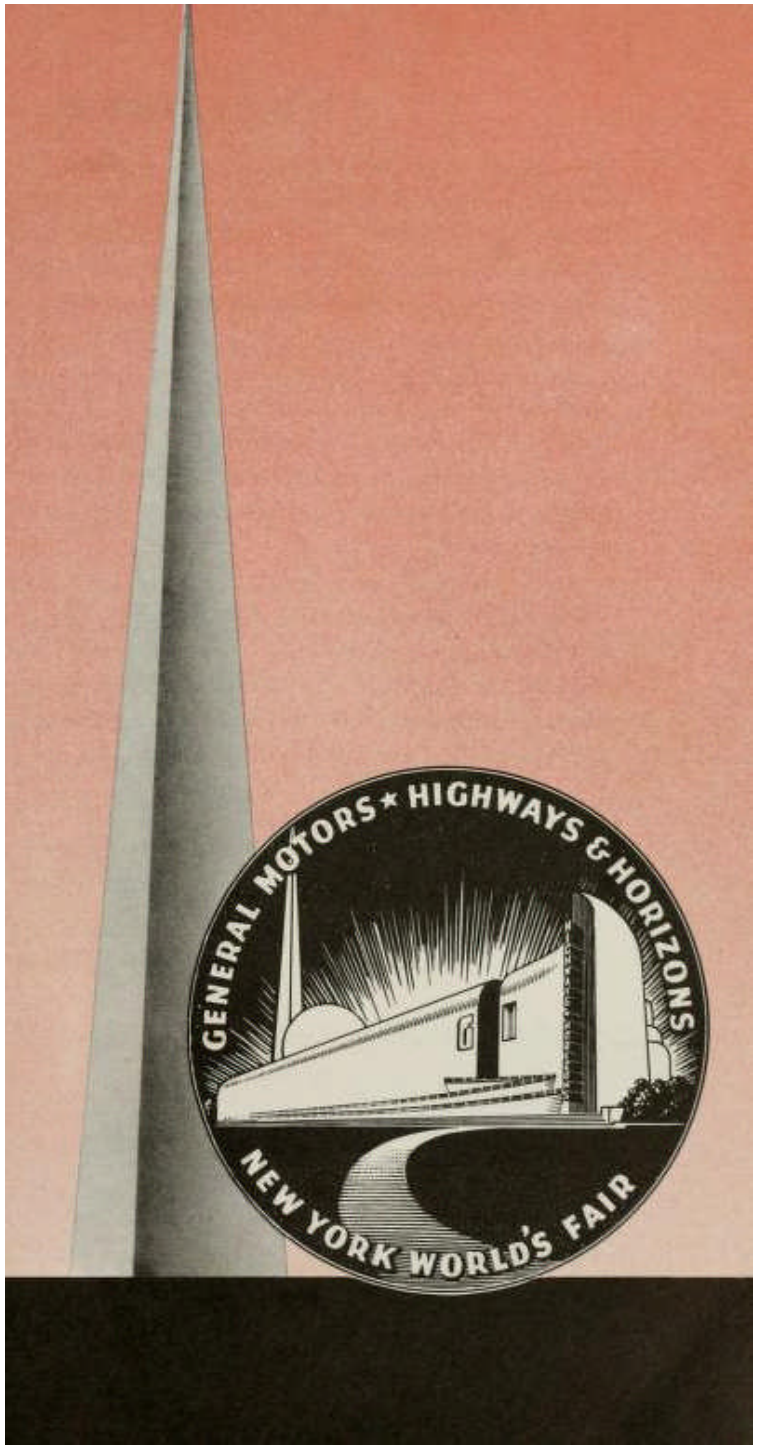


"Future city street of 1960 completely separates autos and pedestrians. Sidewalks and show windows are at the second-story level. Cars drive from ground roadways to great parking spaces under buildings. The roofs of the low-lying buildings are parks and restaurants. Model auditorium is where General Motors plans to be selling cars in the city of 1960."

LIFE **magazine, June 1939**

"…We are satisfied with the mere possession of the automobile, and fail to make use of its full potentialities. Many of us do not realize that our cars can reliably do up to eighty-five miles an hour, but that the average speed of motor traffic in the United States is twenty miles an hour; that although our cars have been designed for efficiency and economy, the loss due to traffic congestion in New York City alone is a million dollars a day; that although our cars have been designed for safety, there is a death toll on American roads today of almost four lives every hour, ninety every single day, 2,700 a month, and 32,400 a year! Until recently, we have been told that the cure for these paradoxes lies in hit-or-miss, spasmodic road 'improvements' and catchy safety slogans. But we are due to open our eyes any day now, and demand a comprehensive, basic solution to a comprehensive, basic problem…"

RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*



"…The people who conduct polls to find out why other people do things, and the editorial writers, newspaper men and columnists who report daily on the doings of the human race, all had their theory as to why the Futurama was the most popular show of any Fair in history. And most of them agreed that the explanation was really very simple: All of these thousands of people who stood in line ride in motor cars and therefore are harassed by the daily task of getting from one place to another, by the nuisances of intersectional jams, narrow, congested bottle-necks, dangerous night driving, annoying policemen's whistles, honking horns, blinking traffic lights, confusing highway signs, and irritating traffic regulations; they are appalled by the daily toll of highway accidents and deaths; and they are eager to find a sensible way out of this planless, suicidal mess. The Futurama gave them a dramatic and graphic solution to a problem which they all faced…"

RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

"…General Motors bids you welcome to the HIGHWAYS AND HORIZONS exhibit at the New York World's Fair. The history of American roads is the history of our civilization as it marched westward from the Atlantic to the Pacific – roadways forging ever onward through mountain, desert and forest barriers, leaving in their wake great thriving cities, industrial centers and prosperous farms. General Motors salutes the men who pioneered these roads. General Motors salutes the United States Bureau of Public Roads – the highway officials of our states, the traffic administrators of our cities and the individuals and organizations everywhere who are contributing so importantly to highway progress for the future…While much has been accomplished in improving our highways, actually in many sections today's traffic is moving on roadways designed for yesterday. With the continued improvement of the motorcar and its ever-increasing contribution to our daily lives, our highways must be improved and expanded…"

RE: excerpt from the narration of the "Highways and Horizons" exhibit

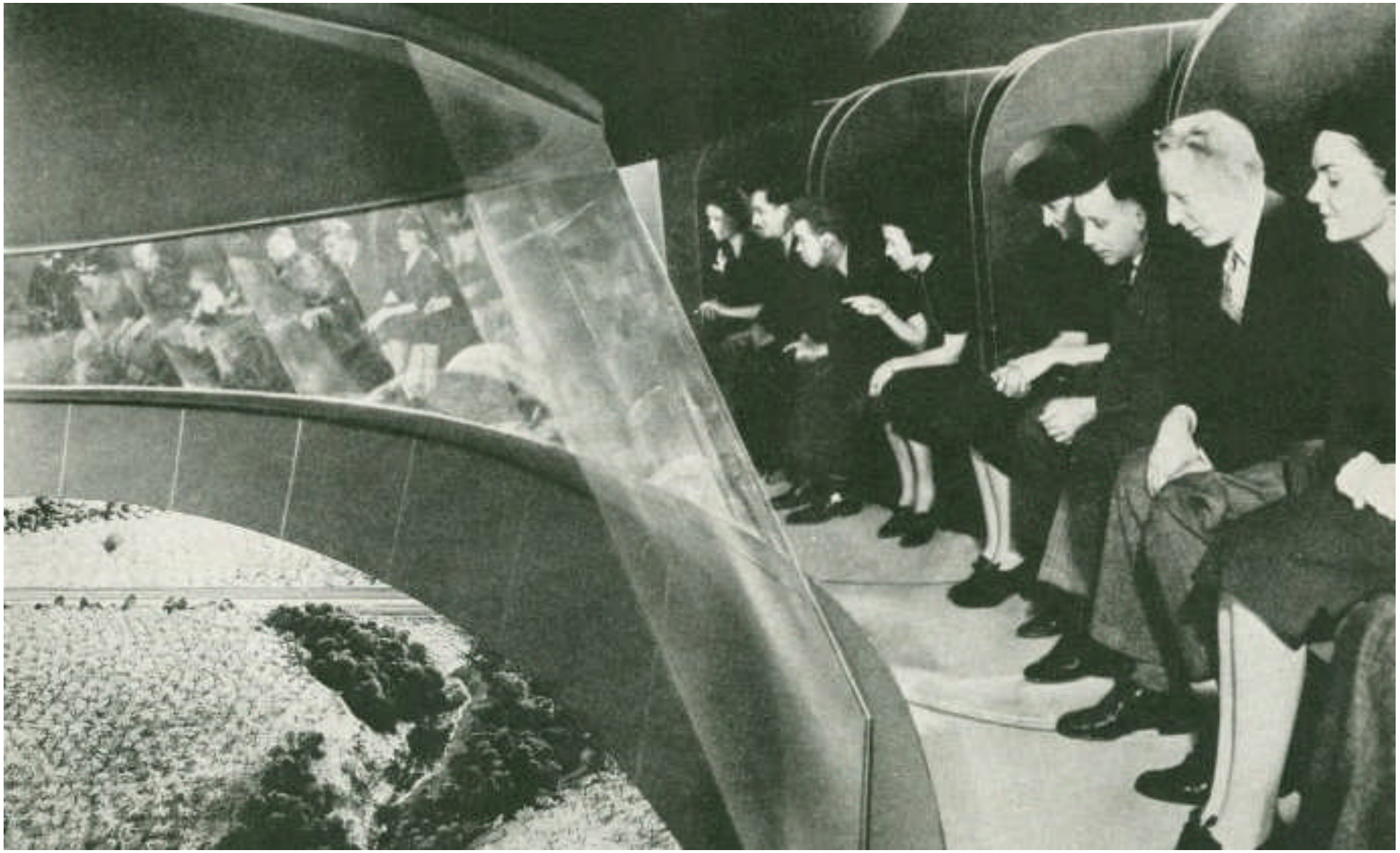
"…As all those who saw it know, the Futurama is a large-scale model representing almost every type of terrain in America and illustrating how a motorway system may be laid down over the entire country – across mountains, over rivers and lakes, through cities and past towns – never deviating from a direct course and always adhering to the four basic principles of highway design: safety, comfort, speed and economy. The motorways which stretch across the model are exact replicas, in small scale, of motorways which may be built in America in the near future. They are designed to make collisions impossible and to eliminate completely traffic congestion. Particular features of the motorways may perhaps be improved on, details of future road construction and engineering may differ, but the design of these motorways has been carefully and thoroughly worked out and is suggestive of probable future developments…"

RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

Carry-Go-Round

"…General Motors have been very generous in letting Mr. Bel Geddes have more or less unlimited scope in arranging the whole thing, and not the least of their generosity has been the new fangled and expensive 'carry-go-round' or moving sidewalk which will take passengers along the edges of the panorama on a quarter mile, 15-minute ride in comfortable two-seat cars, each equipped with a soft-speaker instrument which whispers a description into its passenger ears as they roll along. The carry-go-round whisks you up and down and around corners and shows you the highways and countryside and cities as Mr. Bel Geddes thinks they will be some twenty years hence. It gives you distant views and then close-ups, with motion picture technique, and finally lands you right out in the middle of an actual full-sized 1960 street intersection…"

***Brooklyn Daily Eagle,* January 16th 1939**



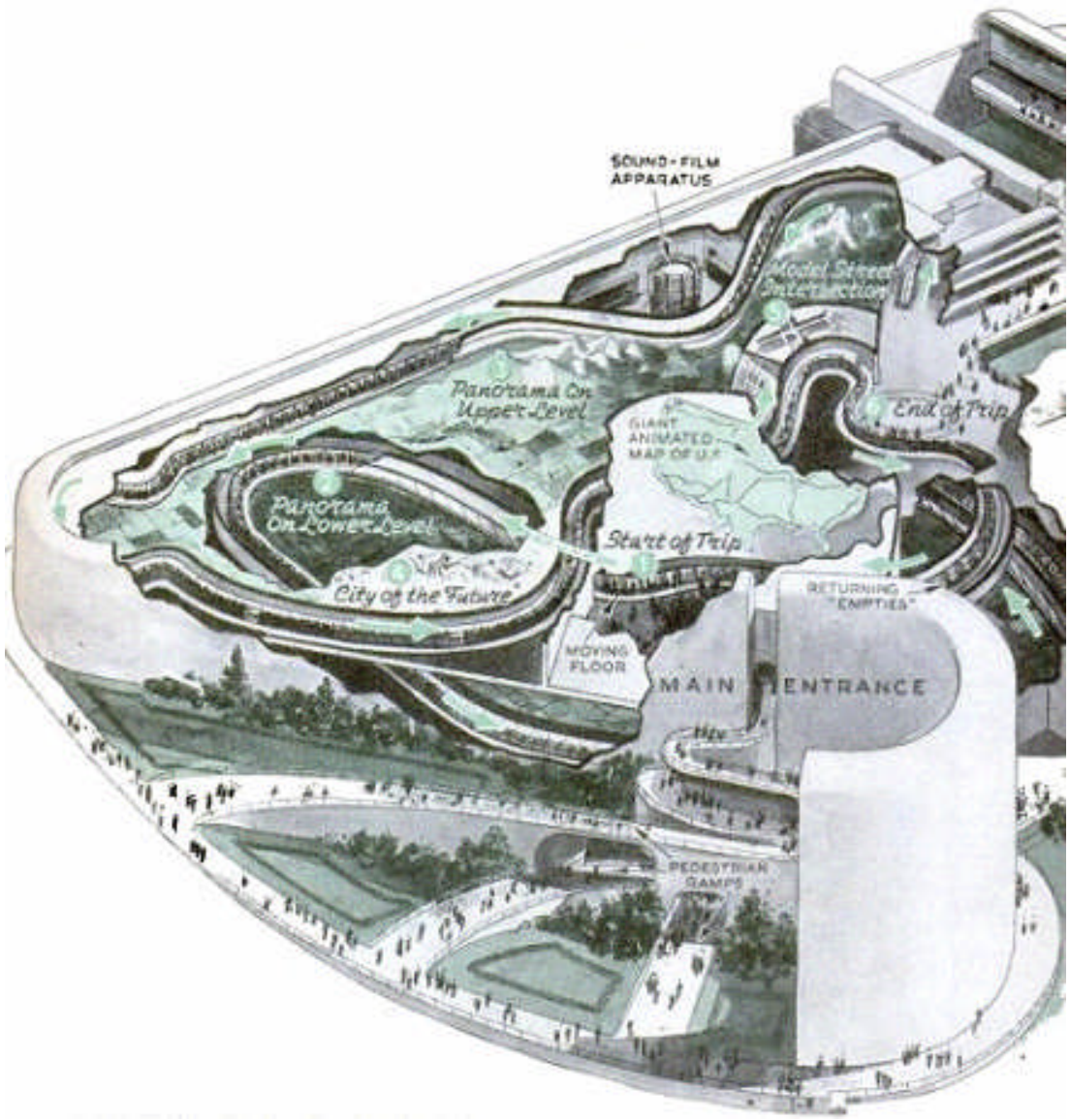
"…One of the best ways to make a solution understandable to everybody is to make it visual, to dramatize it. The Futurama did just this: it was a visual dramatization of a solution to the complex tangle of American roadways…" 198

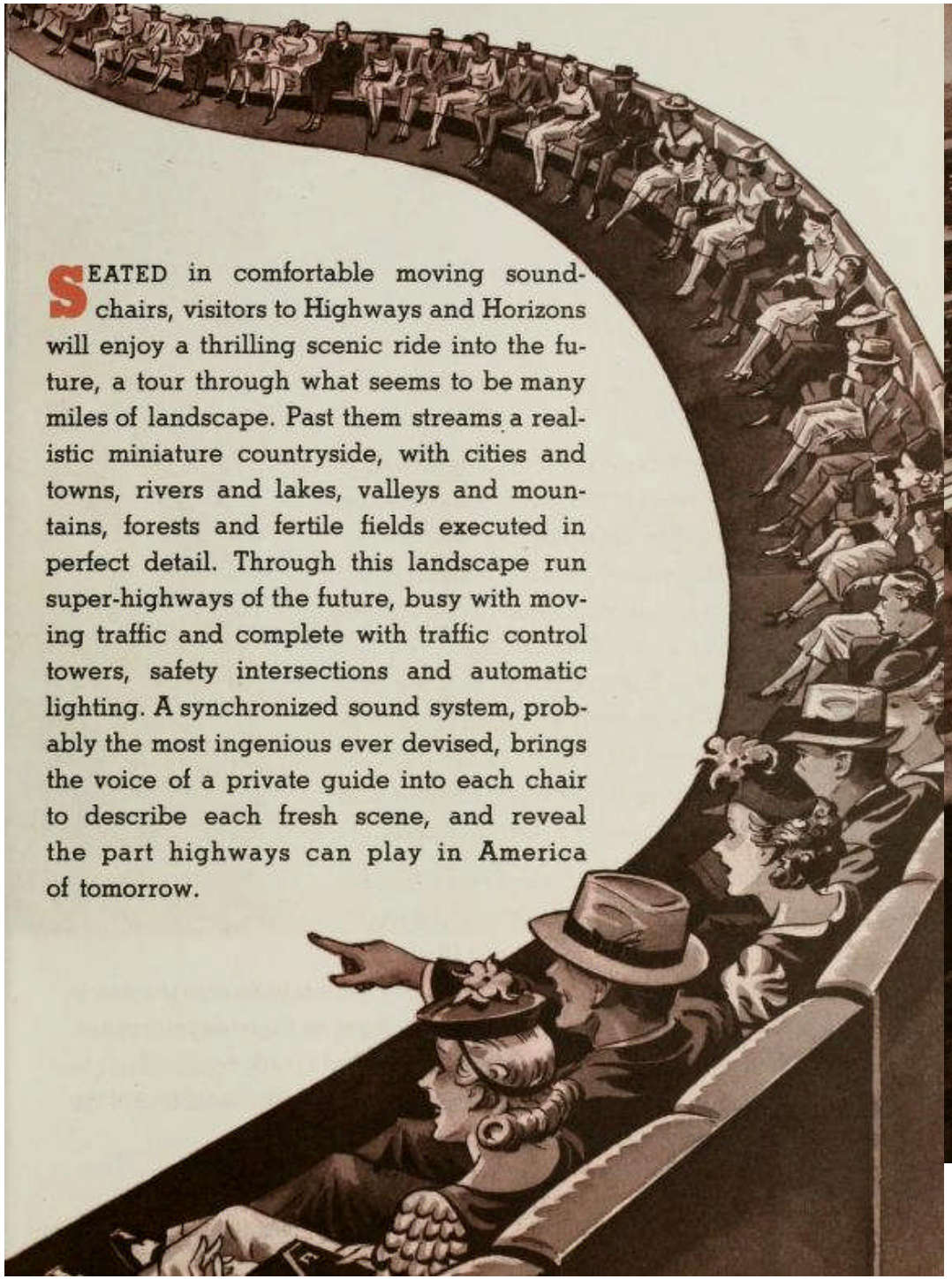
RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

"…Much of the initial appeal of the Futurama was due to its imaginative quality. But the reason that its popularity never diminished was that its boldness was based on soundness. The plan it presented appealed to the practical engineer as much as to the idle day-dreamer. The motorways which it featured were not only desirable, but practical, As each spectator rode around the model in his comfortable, upholstered armchair, he listened to a description of it in a voice which came from a small speaker built into the back of the chair. This recorded description synchronized with the movement of the chairs and explained the main features of what was passing before the spectator's eyes. It directed his attention to the great arterial highways which were segregated into different speed lanes and which looked so different from the roads today. It pointed out the overpasses, high-speed intersections and wide bridges over which tear-drop motor cars whisked by at a hundred miles an hour. It commented in passing on the surrounding scenery, the planned cities, decentralized communities and experimental farms. But it did not describe in detail how any of this was to be accomplished. It did not explain how the highway system worked. It could not dwell at length on any specific points of interest because of the short time available…"

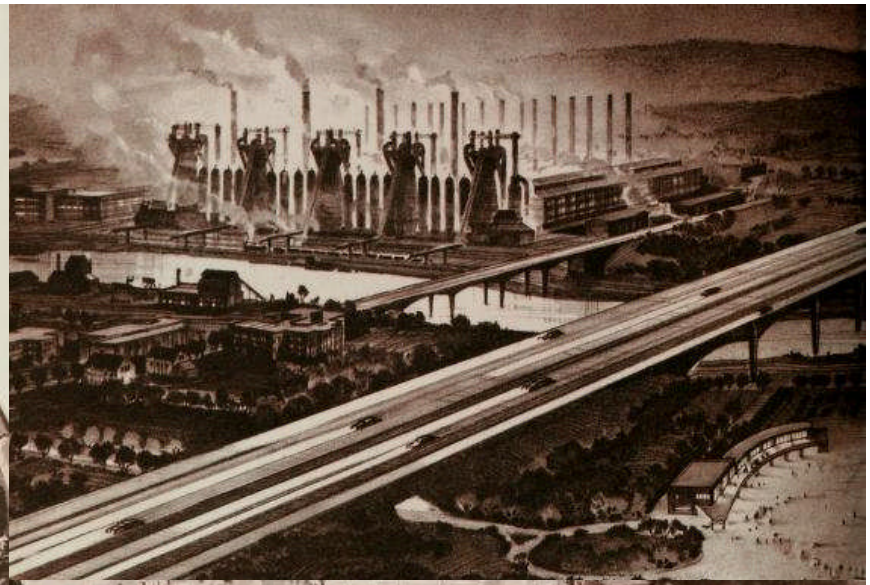
RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

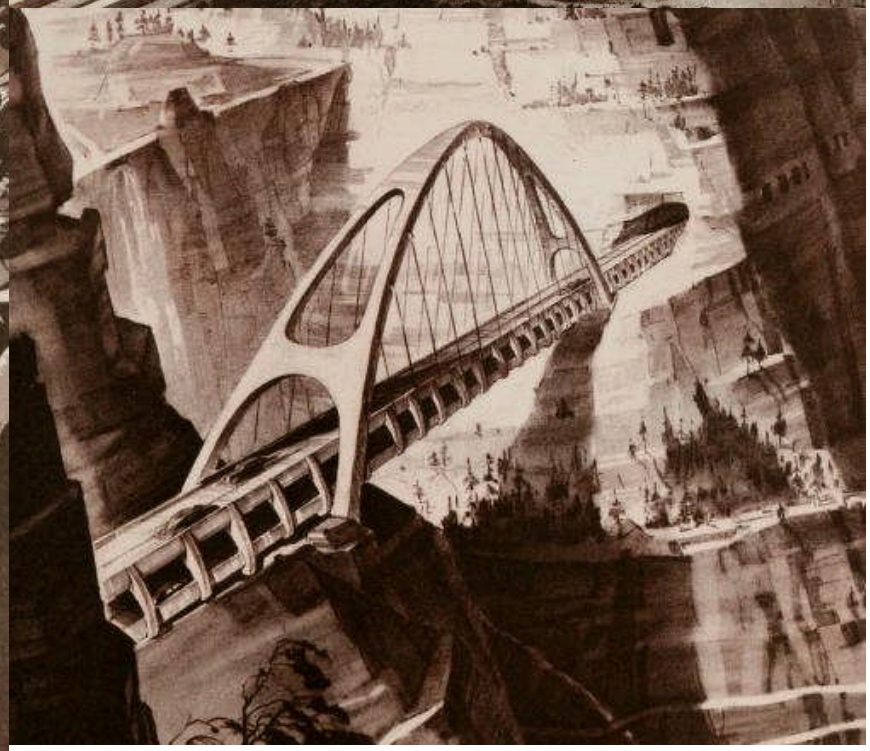
"…Comfortably seated in chairs that form an endless, 300-car train, 600 passengers looking through a long window which parallels the train's route see a vast scale model of cities, farms, factories, mountains, valleys, railroads, and highways unfold before their eyes…"
***Popular Science,* July 1939**
<u>Right</u>: caption: "'Sound-Chair' trains make tour of world's greatest Diorama"

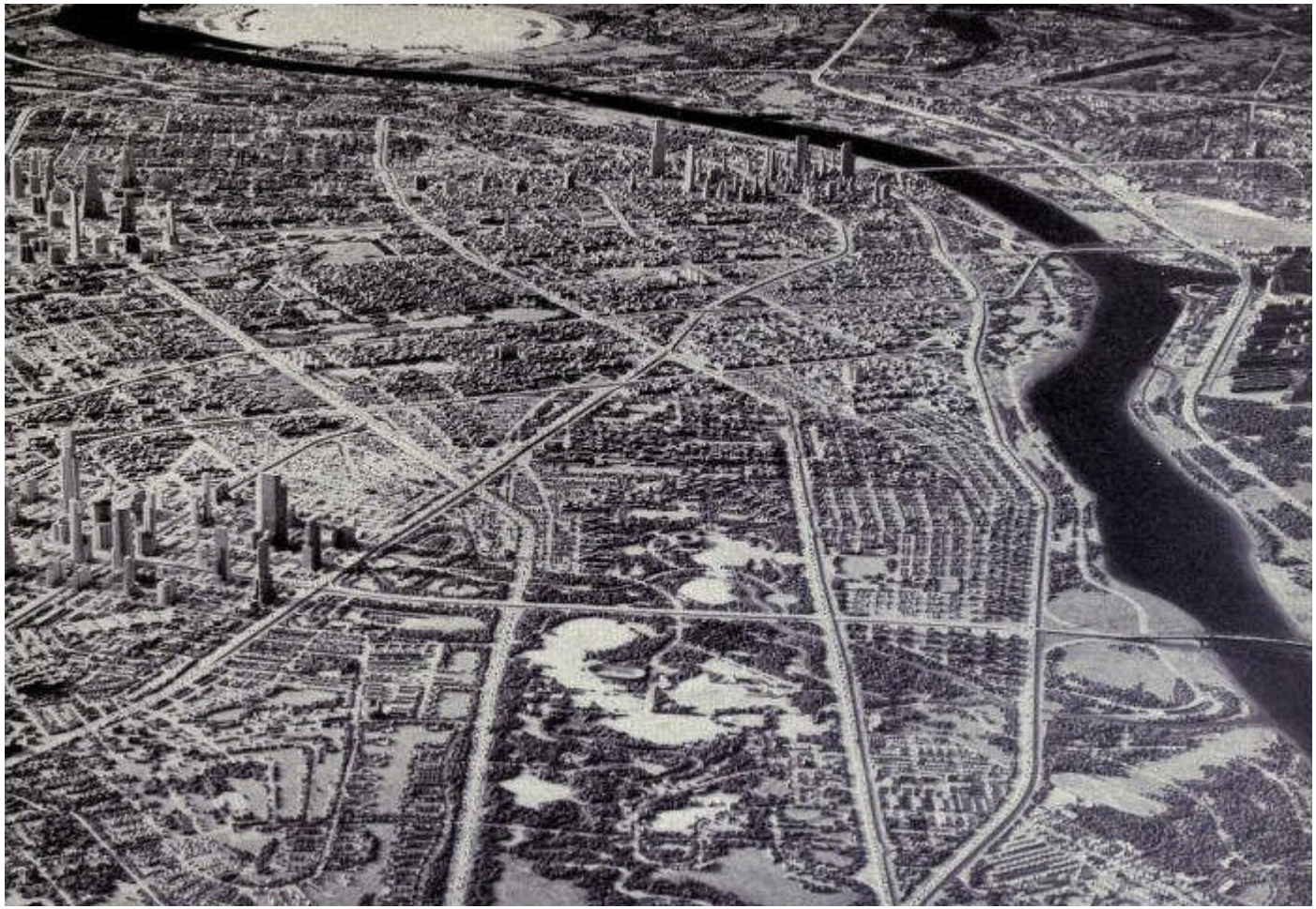




SEATED in comfortable moving sound-chairs, visitors to Highways and Horizons will enjoy a thrilling scenic ride into the future, a tour through what seems to be many miles of landscape. Past them streams a realistic miniature countryside, with cities and towns, rivers and lakes, valleys and mountains, forests and fertile fields executed in perfect detail. Through this landscape run super-highways of the future, busy with moving traffic and complete with traffic control towers, safety intersections and automatic lighting. A synchronized sound system, probably the most ingenious ever devised, brings the voice of a private guide into each chair to describe each fresh scene, and reveal the part highways can play in America of tomorrow.

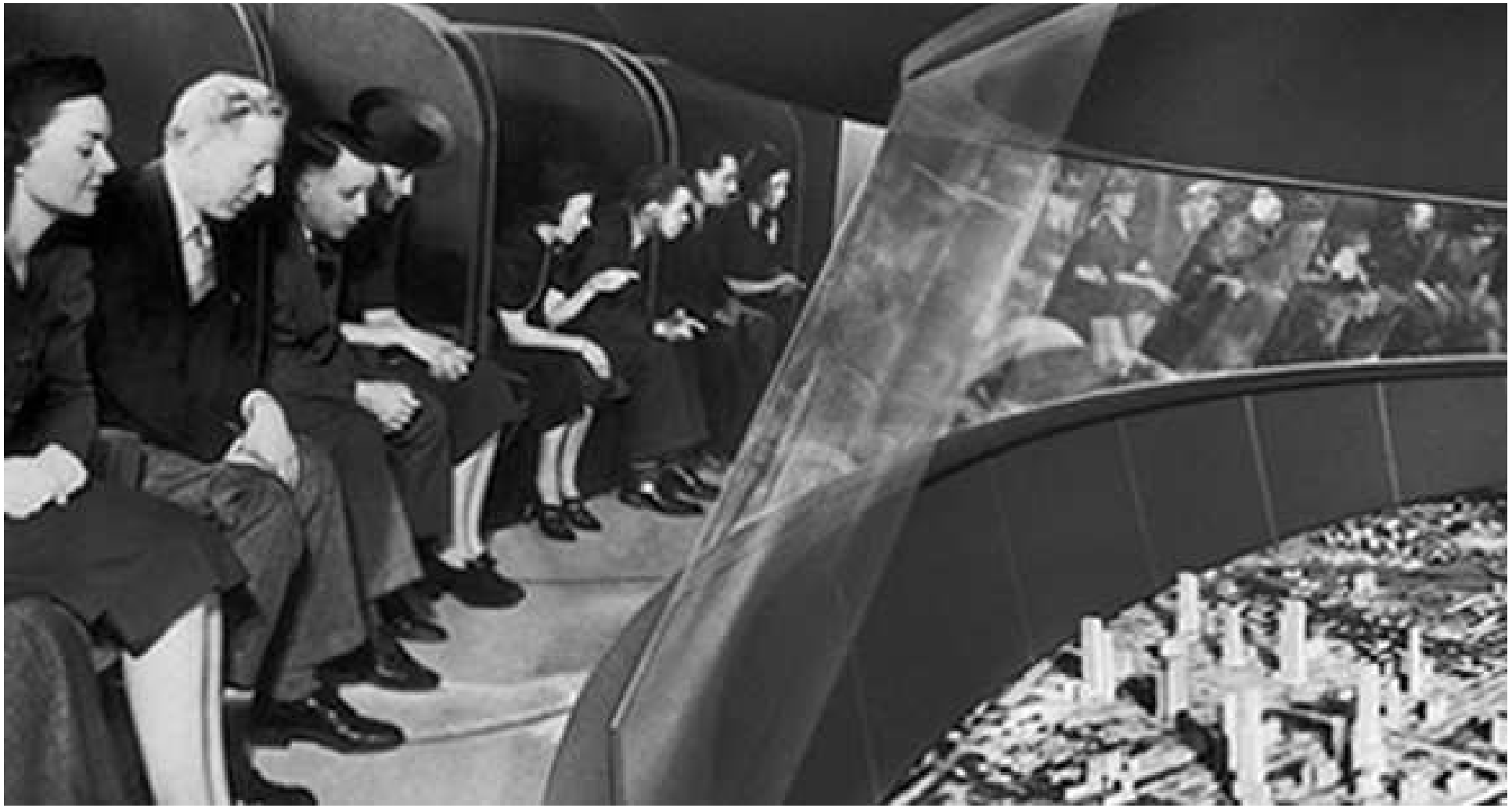






"…There was much to see, and no time to see it. There was much to explain, and no time to explain it. Millions of people, by waiting patiently for their turn in the chairs, demonstrated that the prospects of America's future concern them. They showed that the problems of transportation vitally interest them. But there was no time to satisfy their interest fully. They saw the world of tomorrow lying invitingly before them – a world that looked like Utopia and that did not seem to have a very close relation to the world they knew. But they weren't let in on the secret of how it had developed; they weren't told how it worked…"

RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*



"…The green extended widths show the increased traffic flow estimated by 1960. During the next twenty years motor traffic on some of our main highways is expected to increase by as much as 100 percent – particularly in and about metropolitan areas. The number of motorcars by 1960 may reach from between 35,000,000 to 38,000,000. Anticipating this, highway officials and engineers are constantly at work on ways and means to improve our future highways…" 205

RE: excerpt from the narration of the "Highways and Horizons" exhibit

"…Starting from the facts of congestion, confusion, waste and accidents, we have gone through analysis and blueprints until we have come out on the other side with an over-all plan. We have come out with transcontinental roads built for a maximum of one hundred and a minimum of fifty miles an hour. We have come out with cars that are automatically controlled, which can be driven safely even with the driver's hands off the wheel. We have discovered that people could be driving from San Francisco to New York in twenty-four hours if roads were properly designed…"

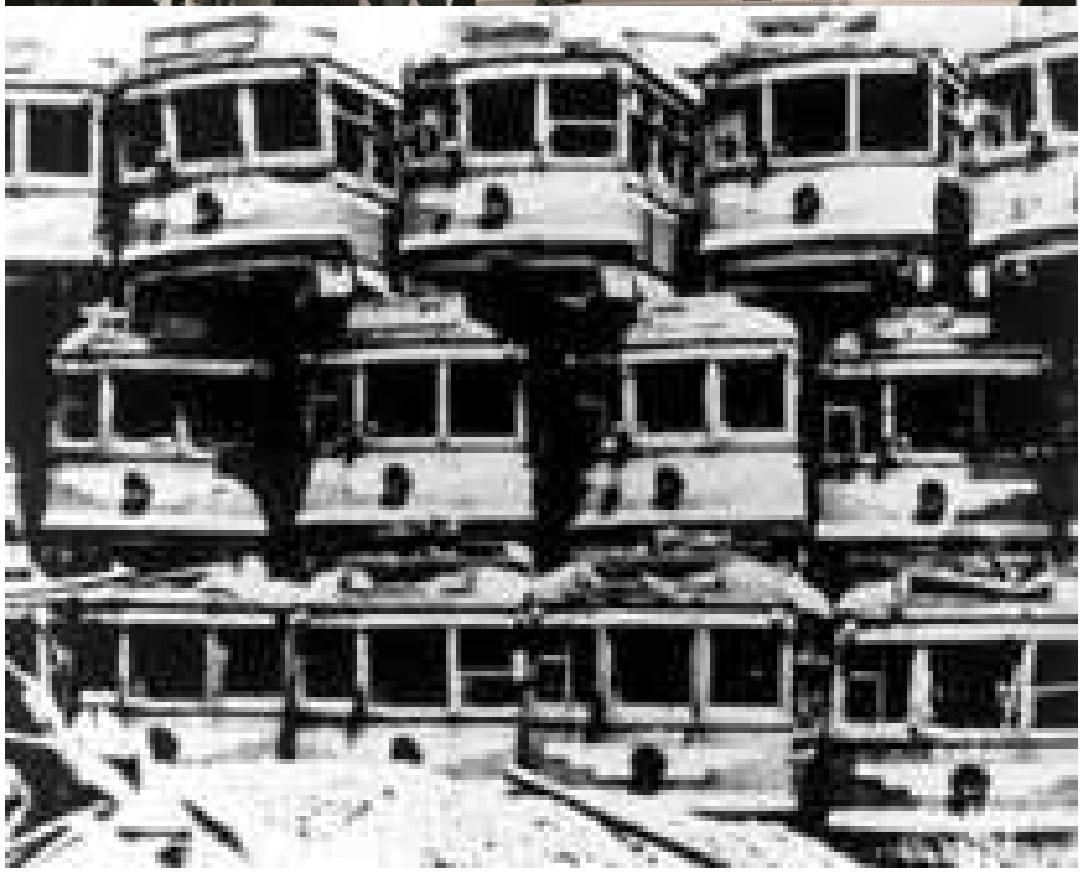
RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

"…The real trouble with American highways is the simple fact that they are not designed for the traffic they bear. The automobile has advanced in much greater strides than have roads. It has attained a far greater point of perfection. Automobiles are in no way responsible for our traffic problem. The entire responsibility lies in the faulty roads, which are behind the times. When the horse was discarded, the winding roads over which he joggled were not discarded with him. The automobile inherited them. Some of them have been 'improved' from time to time, but their basic features have remained unchanged. The result of pushing motor cars out over these old roads was at first simply a mild havoc and runaway horses, but later, the Traffic Problem. Today we are still rebuilding old roads that were constructed for another vehicle, instead of starting to build special roads for the special needs of the automobile. This simple fact is the key to the whole present-day traffic problem…"

RE: excerpt from *Norman Bel Geddes'* 1940 book *Magic Motorways*

<u>Above</u>: upon exiting the *Futurama* exhibit, visitors received a button with the simple inscription: *"I Have Seen the Future"*

The Highway Lobby



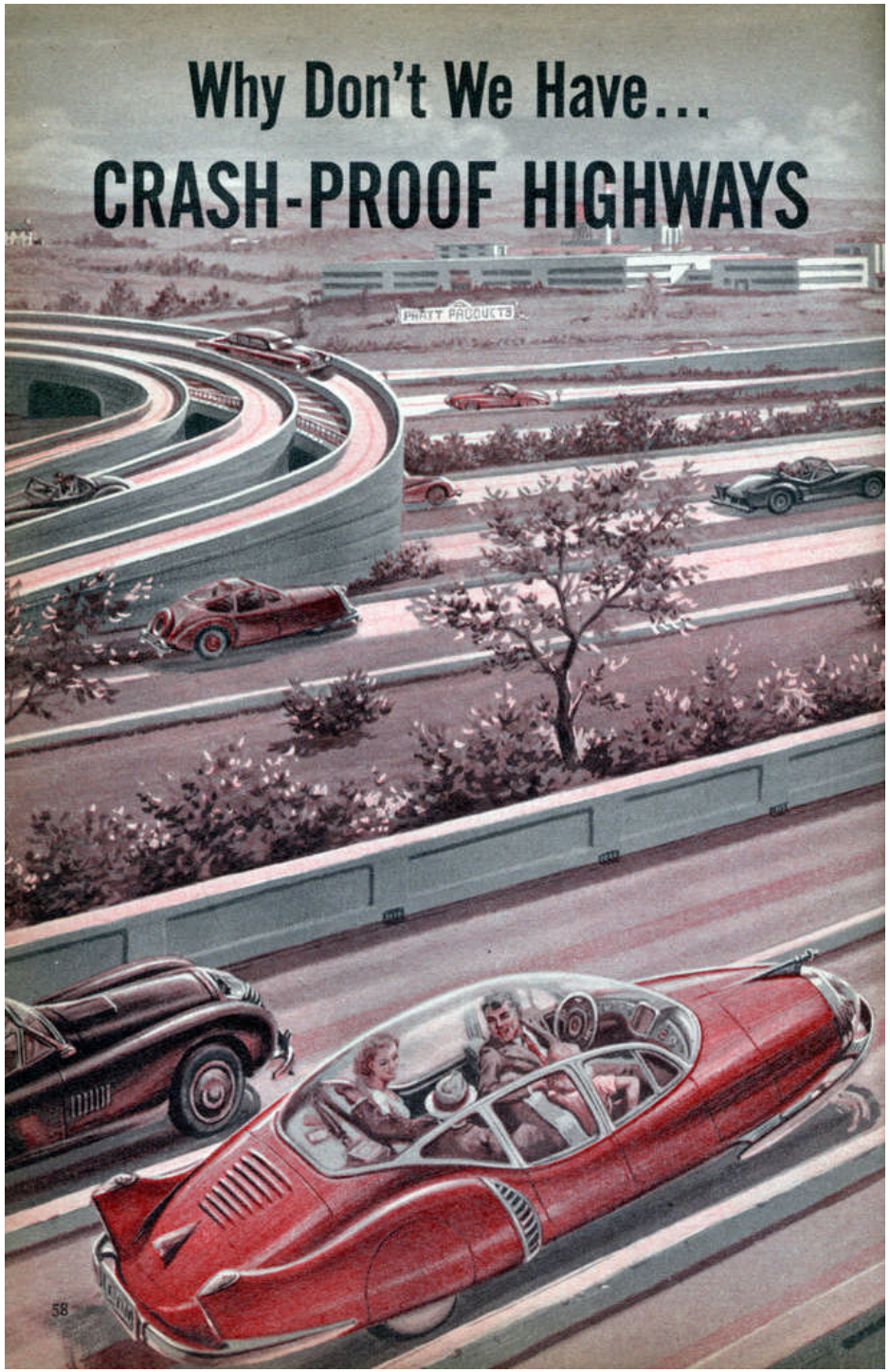
In June 1932, GM President, *Alfred P. Sloan*, created the "National Highway Users Conference" (NHUC) inviting oil and rubber firms to help GM bankroll a lobbying effort to replace streetcars with automobiles which, collectively, came to be known as "The Highway Lobby." GM bought out *Omnibus Corp*. - the nation's largest bus operating company - and *Yellow Coach* - the largest bus manufacturer. With these two acquisitions, GM began a campaign to "modernize" New York City's transportation system. In 1936, GM formed "National City Lines" (NCL), using NYC as an example of replacing streetcars with buses. Within ten years, NCL controlled transit systems in over 80 cities. GM denied control of NCL, but the bus line's Director of Operations came from Yellow Coach and board members came from *Greyhound*, a company founded by GM. Later, *Standard Oil of California, Mack Truck, Phillips Petroleum* and *Firestone* joined GM's support of NCL.

"There was not a scintilla of doubt that these defendants, General Motors and the others, had set out to destroy the streetcar system."

***Brad Snell*, Auto Industry Historian**

RE: the U.S. Justice Department prosecuted NCL, General Motors and other companies for monopolizing America's transit systems. For eliminating the streetcar system, the corporations involved were eventually found guilty of conspiracy: *"to monopolize the sale of supplies used by the local transportation companies controlled by the City Lines defendants."* Each defendant was fined $5K while key individuals (such as the Treasurer of GM) were fined $1. In 1953, President Eisenhower appointed then GM President *Charles Wilson* as his Secretary of Defense, who lobbied intensely for a system of interstate highways as critical to the national defense. *Francis du Pont*, whose family owned the largest share of GM stock, was appointed Chief Administrator of Federal Highways. Funding for the future "National System of Interstate and Defense Highways" came, primarily, from the Highway Trust Fund's tax on gasoline; to be used exclusively for highways. *Dow Chemical* – major producer of asphalt, entered the PR campaign with a film featuring a testimonial from a grade school teacher standing up to her anti-highway neighbors with quiet indignation stating: "*Can't you see this highway means a whole new way of life for the children?"* The future would prove that with the blessings, came the curses as well. No government sponsored program in the immediate post-WWII years would so transform the landscape – and *America* itself, as the creation of the *Interstate Highway System*.

Crash-Proof Highways

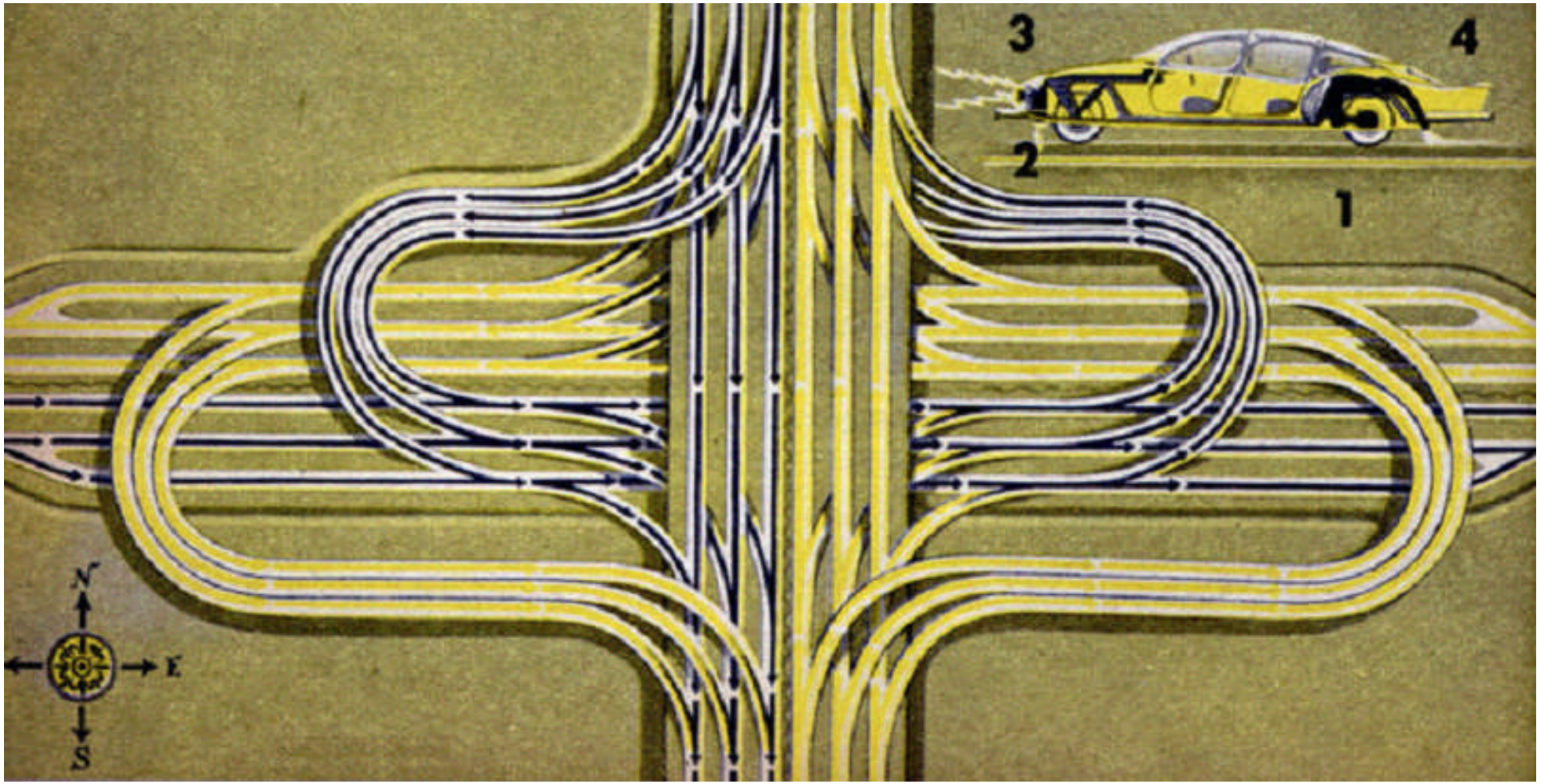


"In this age of flying saucers and 600-mph aircraft, automatic pilots are accepted as being very common-place for airplanes. But why not automatic pilots for autos? If an inventor should offer the motorist an automatic pilot for his car, consider the tremendous safety value of such a device. The human element would be eliminated from driving. Our highways would become virtually crash-proof. Here is a system based on magnetic detection - (similar to that used to locate land mines in World War II) and radar, since it would be impractical to use radio beams as a means of directional control as with aircraft…"

***Mechanix Illustrated*, June 1953**

"…A ribbon of metallic material approximately twelve inches wide is located in the center of each highway lane and would have been incorporated in the highway concrete as it was poured. The automatic pilot needs the following equipment: two magnetic detection units, a radar unit and an engine governor. This unit would work in conjunction with the car's power steering and automatic transmission. The detection units would be mounted under the nose of the vehicle, one on each side of a horizontal line running lengthwise through the body. The narrow-beam parabolic reflector of the radar antenna, enclosed in a streamlined plastic housing, would be mounted on the roof or in the nose of the vehicle. The car is put in motion in the conventional way and driven down the highway centered over the metallic ribbon. The auto-pilot is switched on and the magnetic detection units immediately begin reading the strength of the magnetic field surrounding the metallic ribbon in the pavement below. When the front center of the car is directly over the ribbon, signals transmitted to the power steering device from both detection units will cancel out and the wheels will remain straight. However, should there be a turn in the pavement, the metallic ribbon will also follow the turn and the signal transmitted by one detection unit will increase while the signal from the other will decrease. This will actuate the power steering and the wheels will turn in the direction of the stronger detection signal until the car is centered over the ribbon once more. Having made the turn, the car will straighten out by the same process. The degree of turning by the steering unit will depend upon the signal-strength increase transmitted by the detection unit. The radar antenna transmits a narrow beam which constantly sweeps an area from one boundary of the vehicle lane to the other and continuous indication is obtained of all objects directly in the path of the car such as bridges, sharp curves, dips or obstacles in the road…"

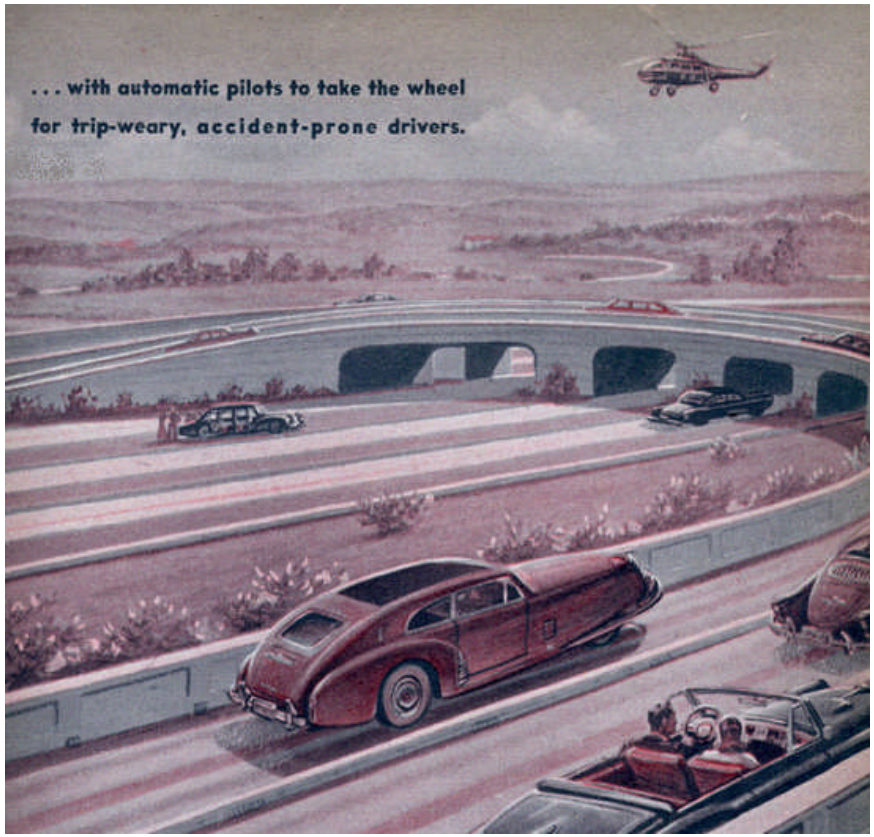
***Mechanix Illustrated,* June 1953**



<u>Above</u>: caption: "MI artist envisions this autopilot highway. Center lines of road-lanes indicate magnetic strip. No car can leave lane, pass, overtake the one ahead. Each is motored into or from line of traffic alternately. Diagram shows cable (1), detector (2), radar unit (3)."

"…Let us assume, for example, that a cruising speed of 50 mph has been established and set up on the control panel. The engine governor will maintain this speed by increasing or decreasing the amount of gas being fed to the engine in response to varying engine loads. After cruising speed has been set on the control panel, changes in the speed are brought about only by the driver's overriding of the auto-pilot or as the result of a signal from the radar unit. Suddenly our car begins to overhaul a slow-moving truck. As soon as it reaches a certain distance from the truck - a minimum safe distance - the signal received from the radar beam bouncing off the truck causes a warning buzzer to sound. In addition it causes the governor to slow the engine of the car to the speed needed to keep that distance. To pass, the driver must over-ride the auto-pilot and control his car manually. When he is once more on-the-beam and his radar unit is silent, he can relax. To turn off the highway, he must override his pilot once more…"

***Mechanix Illustrated*, June 1953**



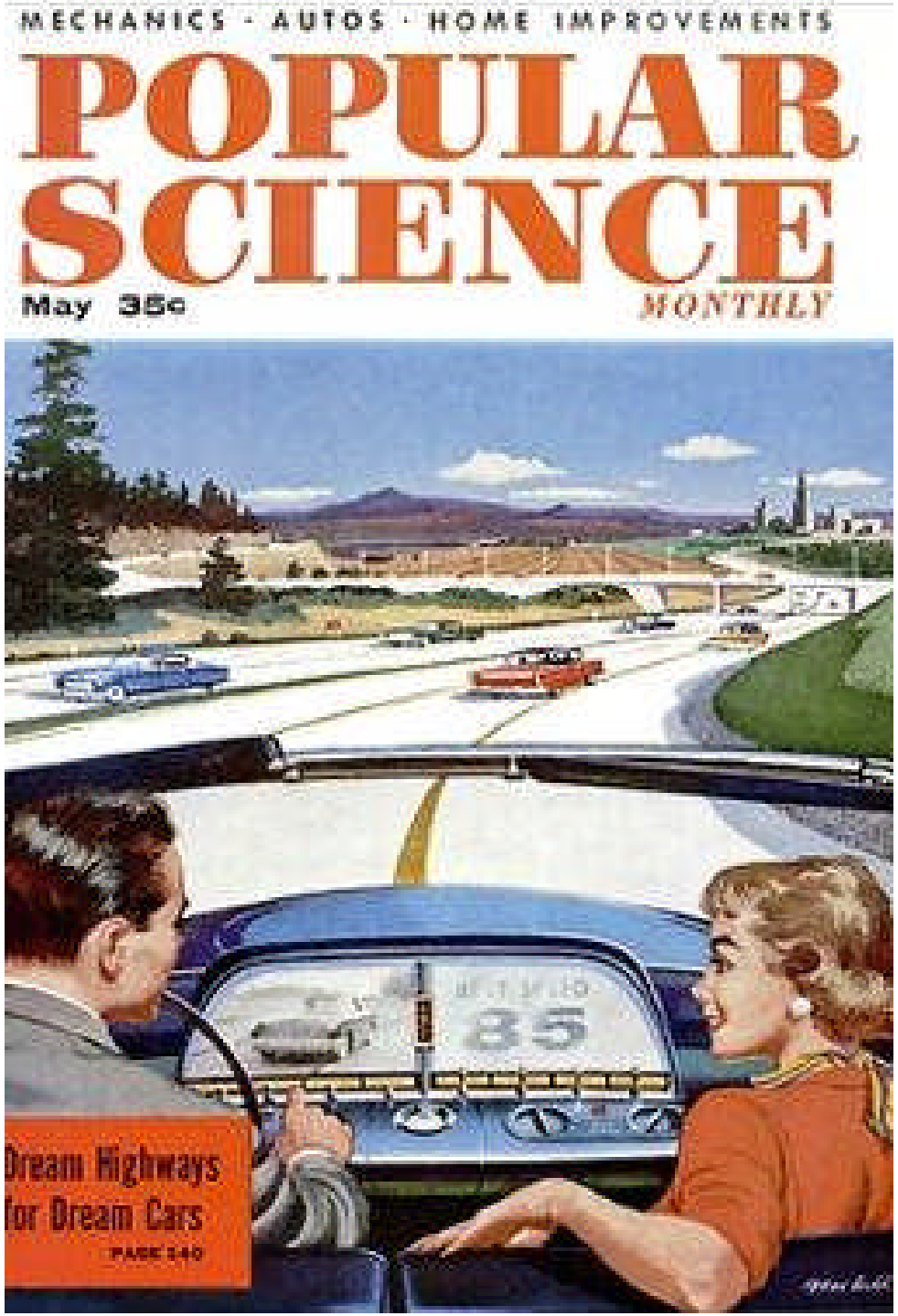
"…Each hazard on the highway will have a small radio transmitter located near it. As the car approaches, the radar beam trips the radio transmitter causing it to emit directional coded signals which designate the safe speed for passage through the hazard. Upon receipt of these signals, our radar receiver again causes the engine governor to slow the car accordingly. What a boon this system would be to bus drivers, truck drivers, salesmen and others who travel long distances!

It would eliminate the strain and fatigue which make them accident-prone. Recent advances in the printed radio circuits and the use of transistors instead of radio tubes would bring the size and cost of an auto-pilot down to a level where it would appeal to the general public. Who knows how long it will be before we actually have such a gadget - and crash-proof highways!

***Mechanix Illustrated,* June 1953**

<u>Above</u>: caption: "Helicopter patrol brings fuel, service and first-aid to the stranded motorist"

Dream Highways for Dream Cars



"…This month's cover (left) carries highway planning beyond present blueprints to show some possible future developments that are now engineers' dreams. On the dashboard in the foreground is a split television screen. The left half serves as a rear-view mirror, connected to a peephole TV camera above the rear bumper. The right half shows the best speed for current traffic conditions, as computed by a remote electronic brain and transmitted to all cars on this stretch of highway. If the driver wishes, he can turn over operation of the car to an area control tower. Then speed and steering will be regulated through a guide strip in the road."

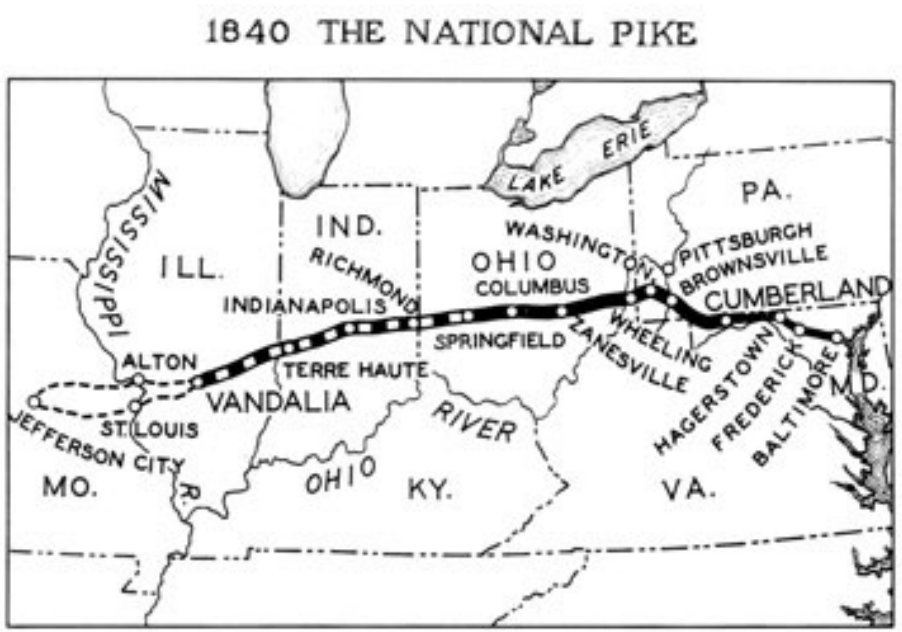
***Popular Science*, May 1956**

Part 4

Origins

A Union of Sentiment

The idea of the Federal Government building transcontinental highways was not a new one. In fact, in 1906 Congressman *William Randolph Hearst* proposed one. The Federal Government did indeed build national highways at one time. The *National Road* - from *Cumberland, Maryland* to *Vandalia, Illinois*. *George Washington* traveled over the Indian trail that later became the National Road as a young man in his twenties on a mission for Governor Dinwiddie to tell the French that they were trespassers at *Fort Le Boeuf* (north of *Pittsburgh*). A few years later, he was sent again, this time with a small force of troops. His mission was not successful, suffering a humiliating defeat at *Fort Necessity*. He traveled the route once again with General *Edward Braddock* and a strong military force. This time, however, they hacked out a road sufficient to drag wheeled canon and wagons. This mission, too, was unsuccessful with Braddock being buried in the middle of the newly constructed road. But that was the beginning of the National Road. In 1803 as part of the legislation admitting *Ohio* to the Union, 2% of the revenues derived from the sale of Federal lands in Ohio were to be set aside for roads, part of it specifically for the National Road. On March 29th 1806, POTUS *Thomas Jefferson* signed legislation authorizing the appointment of three commissioners to build a road from the *Potomac River* at Cumberland, MD, to the *Ohio River* at *Wheeling, WV* (then in *Virginia*). With rivers being the fastest means of travel among the states, the first National Road would provide a land bridge connecting the Potomac and Ohio River/s for settlers bound for the public lands on sale in the new state of Ohio. The road also would facilitate trade and bind the states in what Jefferson called a: "Union of Sentiment." There was some controversy and doubt as to the constitutionality of such an endeavor, but confrontation was avoided between the states through which the road was to pass and resolutions were enacted requesting the Federal government to build the road.



President Jefferson's three commissioners took four years to select the route. Beginning in May 1811, contractors cleared a roadway 66-feet wide with a 30-foot-wide stone surface. The first section opened in 1813 and immediately drew heavy traffic as contractors worked to extend the 130 mile road to *Wheeling, WV,* which the road reached in 1818. Under pressure from *Ohio* and newly admitted *Indiana* (1816) and *Illinois* (1818), *Congress* passed legislation in 1820 authorizing funds to lay out a road from Wheeling to the eastern bank of the *Mississippi River*. Funds for construction, first authorized in 1825, again came from 2% of public land sales in the new states. The *U.S. Army Corps of Engineers* built the extension, which was laid out as straight as possible, (80-feet wide) from Wheeling to *Vandalia* (the capital of Illinois, at the time). In eastern Ohio, the availability of stone for road building allowed for high construction standards, but the rest of the extension was little more than a cleared and graded dirt track. Vandalia remained the terminus because an 18-year struggle between *Alton, IL* and *St. Louis, MO* to be the primary Mississippi River port was still unresolved when Congress stopped funding the *National Road* in 1841.

Left: caption: "The Federal Government built the National Road (National Pike) from Cumberland, MD, to Vandalia, IL, and gave it to the States in the 1830s to operate as a turnpike. As shown on this map, Maryland built an extension from Cumberland to the port of Baltimore."

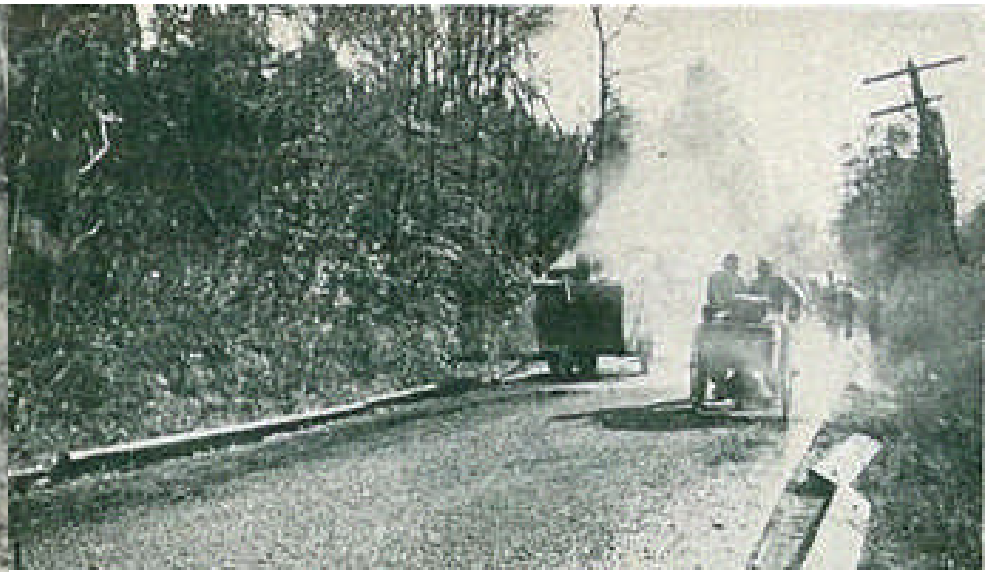
Right: caption: "Traffic on the National Road declined in the 19th century after railroads took much of its Inter-state business. This photograph shows a railroad line (left of picture) along the National Road west of Cumberland, MD."

<u>Above Top</u>: mile marker along the *National Road* in *Columbus, Ohio*.
<u>Above Bottom</u>: As late as the 1930s, U.S. 40 included this National Road "S" bridge west of *Hendrysburg*, *OH*. The bridge was replaced with an arch bridge during reconstruction of the highway in 1933.
<u>Left</u>: start of the National Road marker in *Cumberland, MD*

Object Lesson

...It would greatly increase the value of the interstate roads and stimulate a general public interest in road building if some of these lines (object lesson roads) could be so connected or combined as to form in a measure, a national system, such as was planned and partly built by the Government in the early days of this century. The most effective lines that could be adopted for this purpose would be an Atlantic and a Pacific Coast line, joined by a continental highway extending from Washington to San Francisco."

RE: excerpt from "Public Roads of the Past," published by the *American Association of State Highway Officials* in 1953. The *Office of Road Inquiry* (part of the Department of Agriculture and the direct predecessor of the *Federal Highway Administration*) built the first "Object Lesson Road" at the entrance to the *New Jersey Agricultural College and Experiment Station* at *New Brunswick, NJ* in 1897. In 1913, *The Road-Maker* magazine published an article entitled "The Proposed Interstate Highway System" (prepared by the *National Highway Association*) including a map showing how the highway would connect the state capitols with sixteen-foot wide roads. The system would be 18K miles long and would be paid for by a tobacco tax.



Beginning in the *19th Century*, the "macadamized" technique of road construction (building the road with layers of crushed stone mixed with tar that would create a smooth and water resistant roadway) was used as well as other similar techniques. In the latter part of the century, the *U.S. Office of Public Road Inquiries* (OPRI) sought to adopt techniques to build a better quality road that would be considerably more stable in all seasons and require less maintenance. In addition, a road built by the Federal Government attracted more interest and attention than one built by local authorities. From 1897 until his death in 1901, General *E.G. Harrison* built the first "Object Lesson Road/s" in nearly every state east of the *Rocky Mountains*. He began with the entrance to the *New Jersey Agricultural College and Experiment Station.* The road was built over a section of the main road by putting six inches of rock macadam into a 660-foot section, eight-feet wide. As locals discovered the durability of Object Lesson Roads, the new techniques were adopted.

<u>Above</u>: caption/s: Left: "Putting on the seal coat" / Right: "Applying pea gravel to seal coat"

By the first "Survey of American Roads" in 1904, two million miles of rural public roads existed, and 154K miles were surfaced with gravel, stones or other paving materials. The Object Lesson Roads were setting the example to follow. In 1905, the *U.S. Office of Public Road Inquiries* was renamed the "Office of Public Roads" (OPR). In some communities, the *Object Lesson Roads* resulted in a slow but steady improvement of common roads. In other communities, the establishment of an organized system in road building took place. These roads also demonstrated the use of local and regional materials in road building, such as the use of clay in southern states. In nearly every community where an Object Lesson Road was constructed, some progress was made toward the building of better and safer roads.

Left: caption: "Tractor hauling crushed stone cars"

Right: caption: "U.S. Object Lesson Road"

Born in 1870 in *Richmond, Virginia, Logan Waller Page* (left) was appointed Director of the newly formed *Office of Public Roads* in 1905. Page was a geologist who looked at road building from a scientific point-of-view. He was educated at the *Virginia Polytechnic Institute* and the *Lawrence Scientific School of Harvard University* where, at age 23, he was appointed director of the road materials lab. The lab tested thousands of specimens resulting in Page establishing testing labs in several states. He also spent some time in *France* at the *French Laboratory of Bridges and Roads*, where he learned the French methods of road and bridge building. In 1916, Page developed the "Federal-Aid Road Act" (with a 50/50 Federal/State matching share) sponsored by his friend and colleague *John Hollis Bankhead*. Bankhead was an advocate of the *Good Roads Movement* (1880-1916). The movement was initially led by bicyclists, but with the invention of the automobile, it became a political movement.

The Post Road Act of 1912

"In 1910 Charlie Moorefield and I were the only new full trained road engineers who came into the B. P. R. (under a different title then). It was in 1912 that I learned that something tremendously big in the engineering and administrative line was in the making. At that time the U.S., road-wise was still in the mud. The BPR (actually the name was the Office of Road Inquiry) since 1896 had been building demonstration roads, mostly of 'sand clay' to interest and encourage people, mostly farmers...It started really with the Post Road Act of 1912. I chanced to be handy and was asked to sit in (and say nothing) at an informal meeting in Page's office with Page, Pennypacker, his man Friday, George Coleman, Va., and Henry Shirley, Md. The purpose was a completely informal discussion of how to use the Post Road Act, and I learned, which few persons then knew, that that small tentative tryout was really to determine and advise Congress in a final report what opposite national jurisdictional areas should be considered most feasible, practical, and generally best to cooperate with the Federal Government in some huge plan for joint construction of roads. At that time I think no one in the group had a clear idea of the possible magnitude of the concept or the program they were discussing off hand...Next to the States, then 43, came counties (3000+) not administratively feasible; Congressional Districts (475+) open to 475 fights over pork-barrel funds; Improvement Districts; ad infinitum; too varied, and impermanent. Mr. Page, Director of the Office, and other well-known and active members in such State highway departments as then existed, George Coleman, Va., Henry Shirley, Md., A. N. Johnson, Ill., A. B. Fletcher, Cal., Mr. Rogers of Michigan, and Mr. Green of New York were then considering and promoting the organization of the American Association of State Highway Officials, in order to have an organization with which the Federal Government through the Office of Public Roads, could directly cooperate. This association was finally organized in 1915, about which time the Post Road work was drawing to a close, having been instrumental in constructing what might be called demonstration cooperative roads in Maine, Ohio, Tennessee, Minnesota, Texas and elsewhere, with States, counties, and, as I remember, one improvement district. The Post Road experiment fixed the State as the only feasible cooperative agent. But the bigger concept was moving ahead, and Congress did not await our final Post Road Act report, but on oral advice, I suppose, passed the first Federal Aid Act (of 1916). The first Federal Aid Act provided for no system of roads, set no definite standards of design and construction, set forth no specifications, and was virtually wide open at both ends."

***E.W. James*, Engineer**
RE: letter written in 1965 at the age 90 recounting the early days of Federal road building

An event that had a great effect on what was to come was the *Mexican Campaign* of 1916 whereby General "Blackjack" Pershing chased *Pancho Villa* deep into *Mexico* after a cross-border raid on *Columbus, NM* on March 9th 1916. It was the first use of motorized equipment under actual battle conditions. Some 2K motor vehicles were involved. At the end of the campaign, all 2K vehicles lay strewn along the 200-mile long line of march in various states of breakdown.

<u>Above</u>: caption: "Army camp Columbus, NM. Auto truck supply train about to leave for Mexico"

<u>Left</u>: caption: "U.S. Army truck convoy in Mexico, 1916"

Nevertheless, the motorization was deemed a modest success considering the fact that on the eve of America's entry in WWI in April 1917, the U.S. military was still basically horse dependent. The logistics to ship thousands of horses and their fodder (foodstuff) was considered impractical, so a radical decision was made to motorize. Thus, Detroit produced thousands of trucks and it was decided to drive them, loaded with troops and equipment, to the ports of embarkation. The problem was that there were segments of road where they just couldn't get through, either due to mud or lack of any road improvement at all. Trains of flatcars had to be brought in and the trucks loaded aboard just to get around the impassable segment/s, then road travel would resume. In some cases, this had to be done several times before reaching the port. The 1916 Federal-aid program had barely begun before the *United States* entered the war and the program was essentially shut down. By the end of 1918, the Federal Government was ready to consider starting the program up again, but there was discord among the ranks of the state highway departments, which the 1916 Act required to be established and cooperate as a condition of Federal aid.

<u>Above</u>: typical truck used by the *U.S. Army* during the Mexican incursion of 1916

"The French know how to build roads and also how to keep them up. They are just like a billiard table and every twenty meters there are trees on each side."

RE: France's reputation for good roads was enhanced by America's participation in WWI. In war-torn *France*, American "Doughboys" saw the "good roads" only imagined in the *United States*. Most came home convinced *America* could do at least as well. One of them was Captain *Harry S. Truman* of the 129th Field Artillery (left). While in France, he occasionally had opportunities to indulge his lifelong love of cars, driving and speed. Truman wrote to his future wife; *Bess Wallace*, expressing his admiration for French roads. In the 1920's, as county judge of *Jackson County, Mo*., he initiated the construction of concrete roads modeled on what he had seen in France. He even planted trees along his roads to create the sort of attractive roadside he had admired during the war, Unfortunately, the farmers who lived along the roads mowed the seedlings down. As a future POTUS, he would retain his love of trees and good roads.

"I have traveled over four thousand miles of French roads, main and lateral, built by the central government and also kept in perfect repair, and I note with pain and humiliation the horrible mess that is made by us in our road building, arising from dense ignorance and otherwise."

***Thomas Edison*, 1919**

RE: another famous American who saw France's roads as a sad commentary on their American counterparts was the inventor *Thomas Edison*. He knew America's roads from his motor camping trips with auto innovator *Henry Ford*, tire magnate *Harvey S. Firestone* and naturalist *John Burroughs* (above).

"The old saying that 'The civilization of a country may be judged by the condition of its highways' is certainly true of France. A country can do nothing more useful than bring its roads to the highest state of perfection. Having accomplished this, nothing could be more magnanimous than to invite all other nations to share her experience. This the Republic of France has done…"

***Logan Waller Page*, OPR Director**

<u>Above</u>: caption: "A membership card was issued to every participant in the 1908 International Road Congress in Paris." *France*, with the world's best roads, was the logical choice to host the "First International Road Congress," held Oct. 11-17, 1908. More than 1,600 people from 33 countries attended the congress. OPR Director Logan Waller Page headed the nineteen-member American delegation. For the exhibition hall, OPR provided full-size drawings of the "Page Impact Testing Machine," photographs of a racing car traveling at different speeds over a stretch of road in an experiment to determine the amount of dust raised and a technical description (in three languages) of the OPR's hardness machine. In an address on opening day, Page thanked France for inviting the nations of the world to: *"confront the great problems of road building and maintenance."*

"…dissention and doubt crept into the Association ranks. Some States still did not have a State Highway Department. They were unable to assume their places at our council table. A number of the States which did not have State Highway Departments were not members of the Association. The Association had not sold itself to them. Worse yet, the Association itself began to waver on the principle of Federal-State cooperation conceived by its founders and written into the Federal Aid Road Act of 1916. A movement for a limited mileage system of highly improved highways to be designated, constructed, maintained, operated, and owned by the Federal Government sprouted and grew. This movement found recruits and able advocates in our own ranks. We were thus an Association divided against itself. The Federal-aid principle had not yet had a chance to prove that it could function. There were the inevitable delays, misunderstandings, and friction of the organizing period of a new and untried plan. The war had intruded and immensely complicated the difficulties. The struggle within the Association went on and became more intense. It was in this atmosphere that the Association approached its fourth annual convention held in Chicago in December of 1918. The war was over. The boys were coming home. The Nation was beginning to readjust itself to peace-time pursuits. War transport necessity had thrust the highway problems into the limelight. It was inevitable that the battle of Federal aid versus National Highways would come to a show-down at that convention. And it did. On the show-down resolution to endorse the National Highway plan, the convention voted 50-50. It was a tie. With the delegation present and voting from every State represented at the convention, we were split exactly even. By that slender margin and with not a single vote to spare, did this Association cling to its ideal of Federal-State cooperation laid down by its founders…"

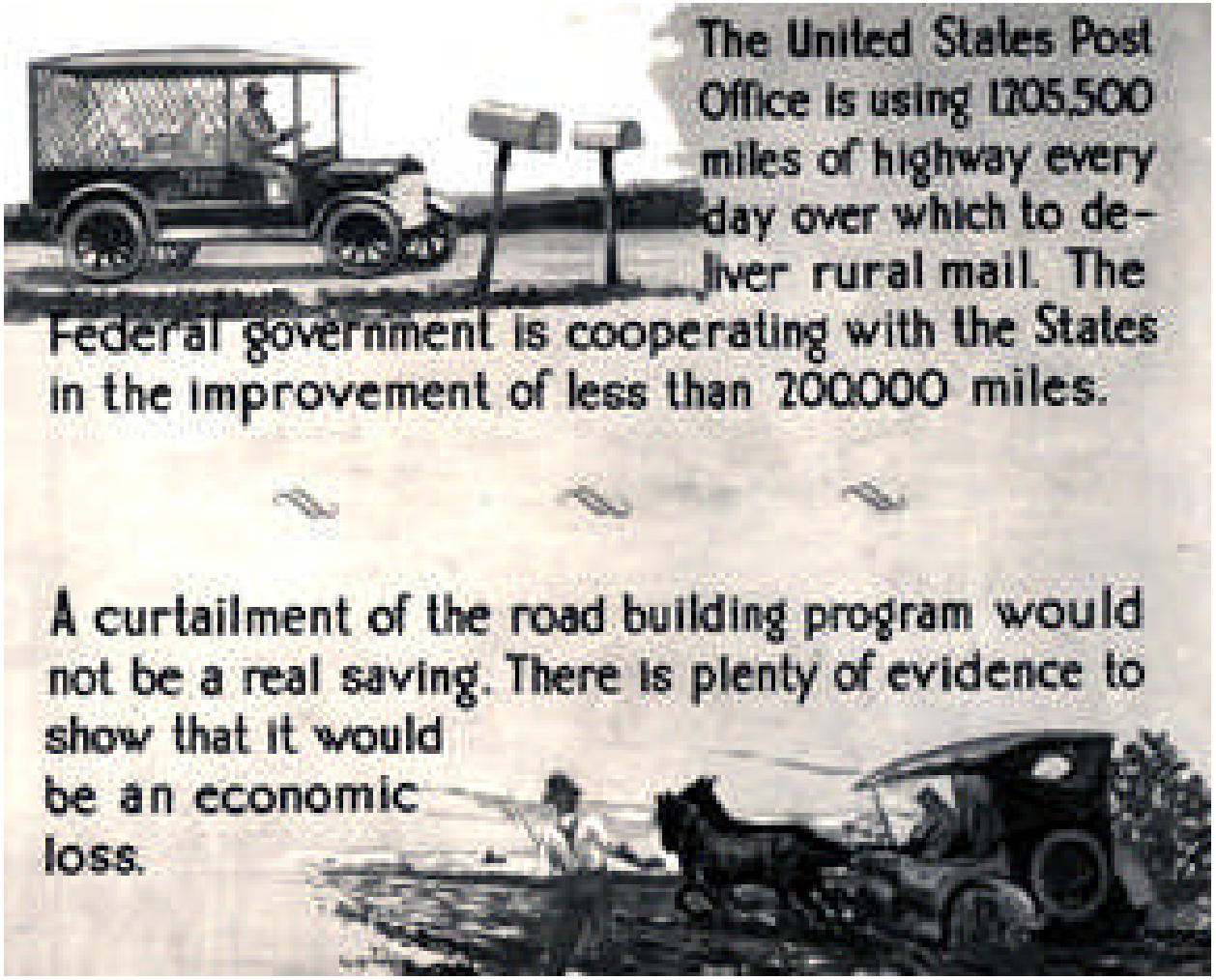
***Fred R. White*, Iowa State Highway Engineer**

RE: recounting post-WWI events (at the annual meeting of the AASHO held in late 1942)

"…we must superimpose upon the classification which is now generally recognized, classes which we may call, for the lack of better names, interstate or national, and special roads. The national roads would serve interstate business and pleasure travel, and in many cases the military requirements also. The special class would include roads of distinct military significance which may have little or no commercial value, and certain special recreational roads. In other words we should have about five classes of roads; the national or interstate, special roads, and the State, county and local roads...We have found by scientific study of the character, origin and destination of highway travel that 90 per cent of the traffic which uses our average highway is of local character. The 10 per cent of the traffic, which in normal times, pushes out beyond local limits, across State lines, and which can therefore be properly described as national in extent, is due to tourist travel by automobile, and freight and express haulage by motor truck...We must provide the roads for the (interstate) carriers. But it is not necessary to build an especially chosen national system to reach this desired end. The same result can be obtained, probably in a shorter span of time, under the present plan of Federal and State cooperation; and the roads we construct under that plan will be so located as to serve the local as well as the national uses. It seems clear to me that while it must be our national policy to provide roads to facilitate commerce by motor truck - the modern highway vehicle, a commerce which is national in extent, and which is not limited by State borders, we can do so by the development of properly articulated local and State systems better than by building special long transcontinental highways, across tributary territory which for some time may not be able to share in the benefits of the through roads because of a lack of local road development. There is no support for the assumption that such long through roads are required for the purposes of military defense...but in the main the highway requirements of war coincide with those of peace..."

Thomas H. MacDonald*, Director – *Bureau of Public Roads

RE: excerpt from a February 1920 address to the *American Road Builders Association* (ARBA)


The United States Post Office is using 1205,500 miles of highway every day over which to de-liver rural mail. The Federal government is cooperating with the States in the improvement of less than 200000 miles.
A curtailment of the road building program would not be a real saving. There is plenty of evidence to show that it would be an economic loss.

The Seven Percent System

...The Bureau does not seek initiative. It does not seek to direct the States but to cooperate with them. There is now a plan of action for the guidance of both organizations that is so clear and so explicit that neither can escape the responsibilities imposed. The Federal requirements are fairly defined and will be sincerely and faithfully enforced…It is going to take a long time to do this work, but we are engaged upon a very large work. One hundred and eighty thousand miles is probably the minimum mileage that will be required to complete such a system and it may run as high as 190,000 or 200,000 miles…"

Thomas H. MacDonald,* Director – *Bureau of Public Roads

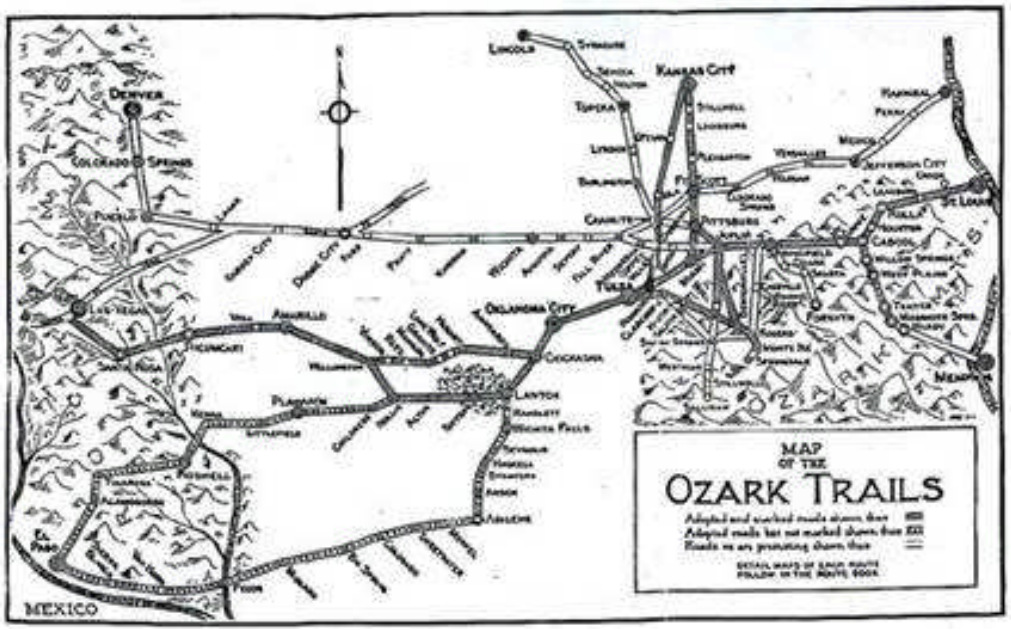
RE: comments made in late 1921/1922. T.H. MacDonald, Chief Engineer of the *Iowa Highway Commission* was the selection to replace *Logan Waller Page* as Director (later "Commissioner") of the BPR upon Page's death. MacDonald defined four classes of highway use; *Agriculture, Recreational, Commercial* and *Military*. He made the case that it would be wasteful to build national highways solely for interstate travel. He noted the phenomenal growth of the cities and felt that improved roads would help to keep people on the farm. As he had done in *Iowa*, MacDonald advocated a classification system comprising 5-7% of all roads. He also felt that ensuring interconnectivity between states was the Federal role and advocated a higher Federal share for states with large amounts of public lands. MacDonald set out to build the State-Federal partnership which would feature; engineering professionalism, dedicated highway user revenues (at the state level), establishment of independent highway commissions, highway research, highway classification, programming and project development (based on economic principles) and transfer of highway jurisdiction from counties and townships to the states.

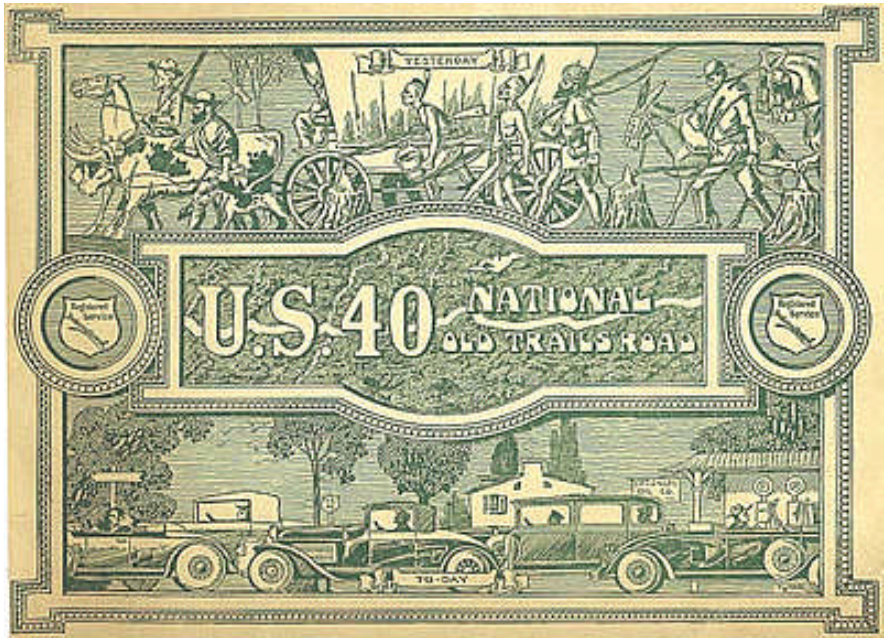
A major milestone in the chronology of events leading to the *Interstate Highway System* was the first "National Conference on Street and Highway Safety" held in *Washington, D.C.* on December 15-16, 1924. It was chaired by future POTUS *Herbert Hoover* (left) - Secretary of Commerce, at the time. Prominent in planning circles and high-ways, FDR's uncle *F.A. Delano* served as vice chairman of the conference. In his later years, he would serve on the "Interregional Highway Committee" that developed the Interstate System.

"This Association hereby requests the Secretary of Agriculture, in cooperation with the several States to undertake immediately the selection and designation of a comprehensive system of through interstate routes and to devise a comprehensive and uniform scheme for designating such routes in such a manner as to give them a conspicuous place among the highways of the country as roads of interstate and national significance."

RE: excerpt from meeting report. At the 1924 annual meeting of the *American Association of State Highway Officials* (AASHO) in *San Francisco*, action was taken (on November 20th) requesting the Secretary of Agriculture to appoint a board composed of representatives of the State highway departments and of the *Bureau of Public Roads.*

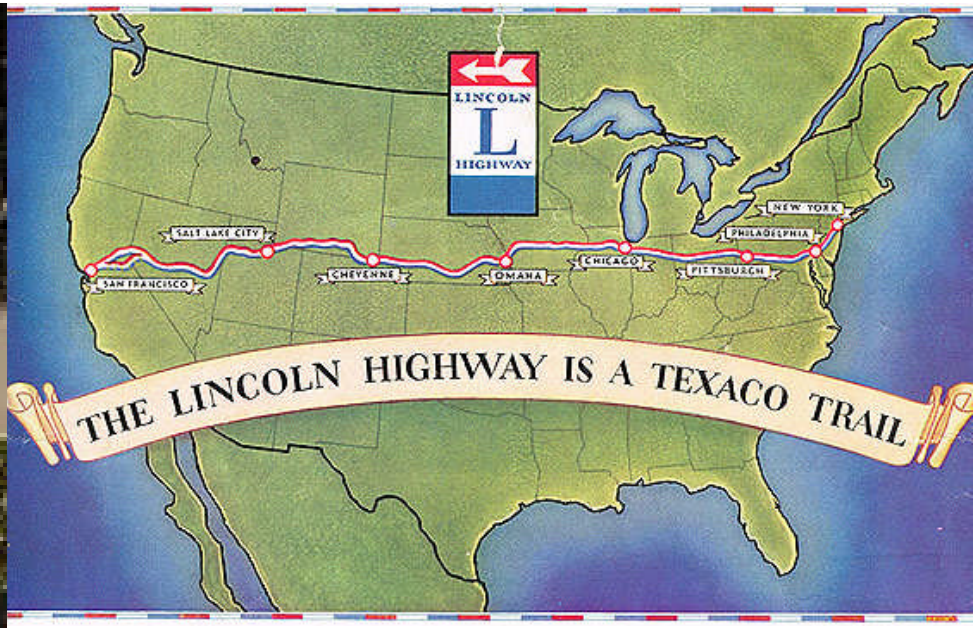
The *Joint Board on Interstate Highways* felt that it was legally bound to not exceed the three-sevenths of the "seven percent system" (established in the 1921 Act) as "primary or interstate highways." The 1921 Federal Act had required that all Federal aid be spent on a system comprised of not to exceed seven percent of total highway mileage; *"Highways which may receive Federal aid shall be divided into two classes, one of which shall be known as primary or interstate highways, and shall not exceed three-sevenths of the total mileage that may receive Federal aid, and the other which shall connect or correlate therewith and be known as secondary or inter-county highways..."* In its final deliberations, the Board recommended 2.8 percent of all the highways and roads in the nation be numbered as "Interstate Highways." At its April 20th 1925 meeting, the Joint Board, among other things, passed the following resolution: *"3. The selection of approximately 1 percent or less of the total highway mileage of the State as of greatest importance; of a second 1 percent approximately as of secondary importance; and a third 1 percent approximately as of tertiary importance; and that these suggested percentages be increased in sparsely settled States."* It's interesting to note that the present-day *Interstate Highway System* represents approximately 1% of total national highway mileage.





"…Although no records had ever been systematically collected in an effort to cover the whole field, there appeared in the official files of the States and of the Bureau of Public Roads evidence that at least 250 marked trails existed in the country. These were sponsored by at least one hundred regularly organized associations supporting some kind of headquarters and issuing maps, advertising, or other promotion material…"

RE: excerpt from report of *The Joint Board on Interstate Highways*, November 18th 1925



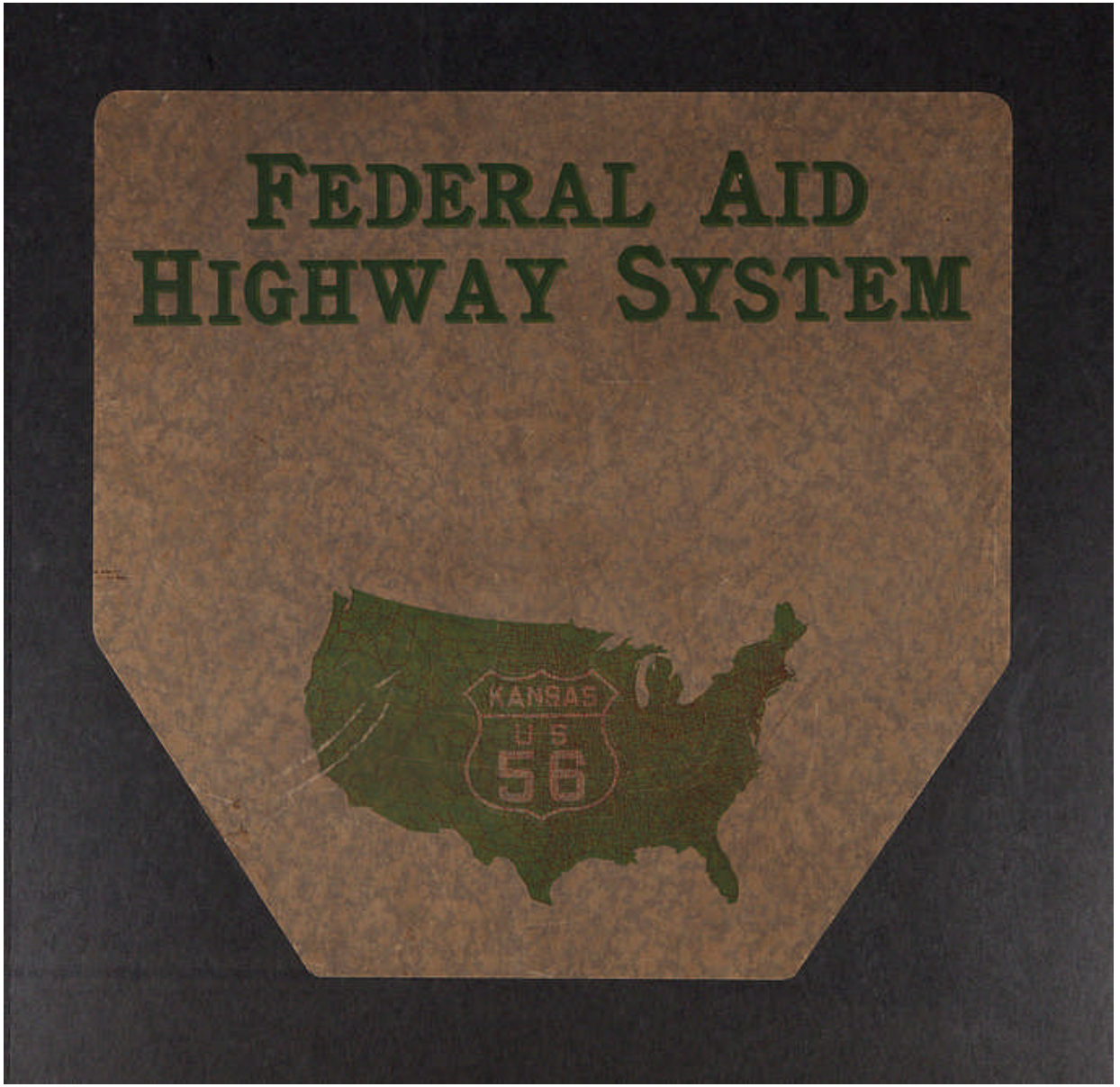
<u>Above</u>: caption: "The first transcontinental paved road in the U.S. finished well before WWII was dubbed the 'Lincoln Highway,' here used to advertise a brand of gasoline." By the mid-1920's, there were about 250 "National Auto Trails." Some were major routes, such as the *Lincoln Highway*, the *Jefferson Highway*, the *National Old Trails Road*, the *Old Spanish Trail* and the *Yellowstone Trail*, but most were shorter. Some of the shorter routes were formed to generate revenues for a trail association rather than for their value as a route between significant locations.

<u>Left</u>: caption: "Lincoln Highway marker in Carson City, Nevada"

"The next problem that the Joint Board considered was the question of actually designating the various routes. The question of marking the routes at once raised the whole question of signs, signals, and markers. Mr. Frank Rogers suggested the form of a shield for the number, and I was responsible for actually drafting the shield which has been used, providing space for the designation of the necessary number and also of the several individual States. At this point, on April 21st 1925, a Committee on Signs, Signals and Markers was appointed, of which I was Chairman…"

***E.W. James*, BPR engineer**

The period of the mid-to-late 1920's was characterized by phenomenal growth of automobiles and their use which provided an ever growing base of user revenues for the states. "Completion" was the goal, which meant providing a "permanent" improvement to each component of the Federal-aid system. The system was improved from the top-down with major roads receiving primary attention. The first coast-to-coast route was completed in late 1927. By 1930, completion was nearly achieved. Cooperative "Transport Surveys" were done with several states gathering data for the classification of roads and as research tools. These became successively more sophisticated with the "origin and destination" concept developed. Two urban studies were done, the first was in *Cook County* (*Chicago*) while the second was done in *Cuyahoga County* (*Cleveland*). With the stock market crash in October 1929 and the settling in of the *Great Depression*, the first impacts were felt at the state level when legislatures, being pressed for resources, began to divert highway-user revenues to other uses. In November 1929, POTUS *Herbert Hoover* called for an extensive program of public works. In April 1930, *Congress* increased Federal authorizations by 66%. By December 1930, Congress had allocated $80 million to Federal-aid roads. It was expected that the whole program, including states' money, would provide employment for 100K men.


FEDERAL AID
HIGHWAY SYSTEM
KANSAS
US
56

THE FEDERAL AID HIGHWAY SYSTEM

SHOWN ON A MAP OF THE
UNITED STATES
IN 18 SECTIONS
APPROVED BY ARTHUR M. HYDE
SECRETARY OF AGRICULTURE
OCTOBER 31, 1932

PREPARED UNDER THE
DIRECTION OF
THOMAS H. MACDONALD
CHIEF OF THE BUREAU
OF PUBLIC ROADS

NUMBERS APPEARING ON ROADS INDICATE THAT THESE ARE ROUTES ADOPTED NOVEMBER 11, 1926, BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS FOR UNIFORM NUMBERING AND MARKING WITH AMENDMENTS TO DATE

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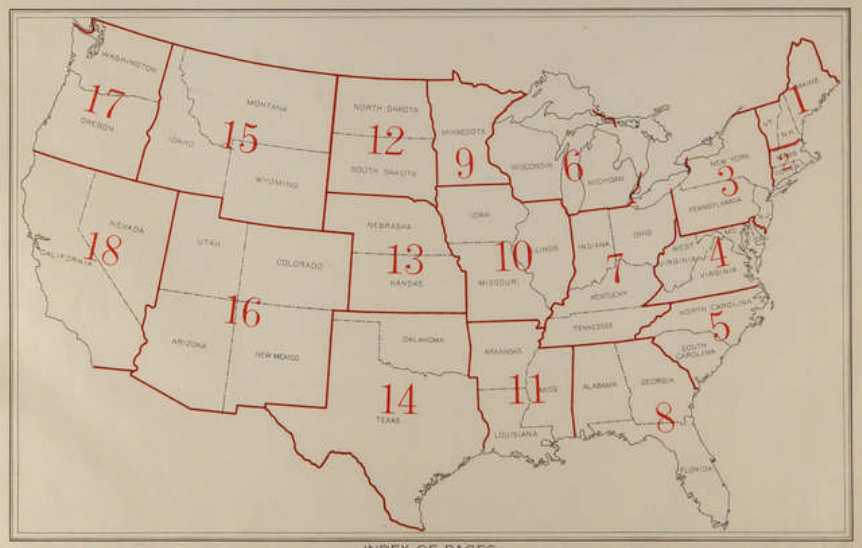

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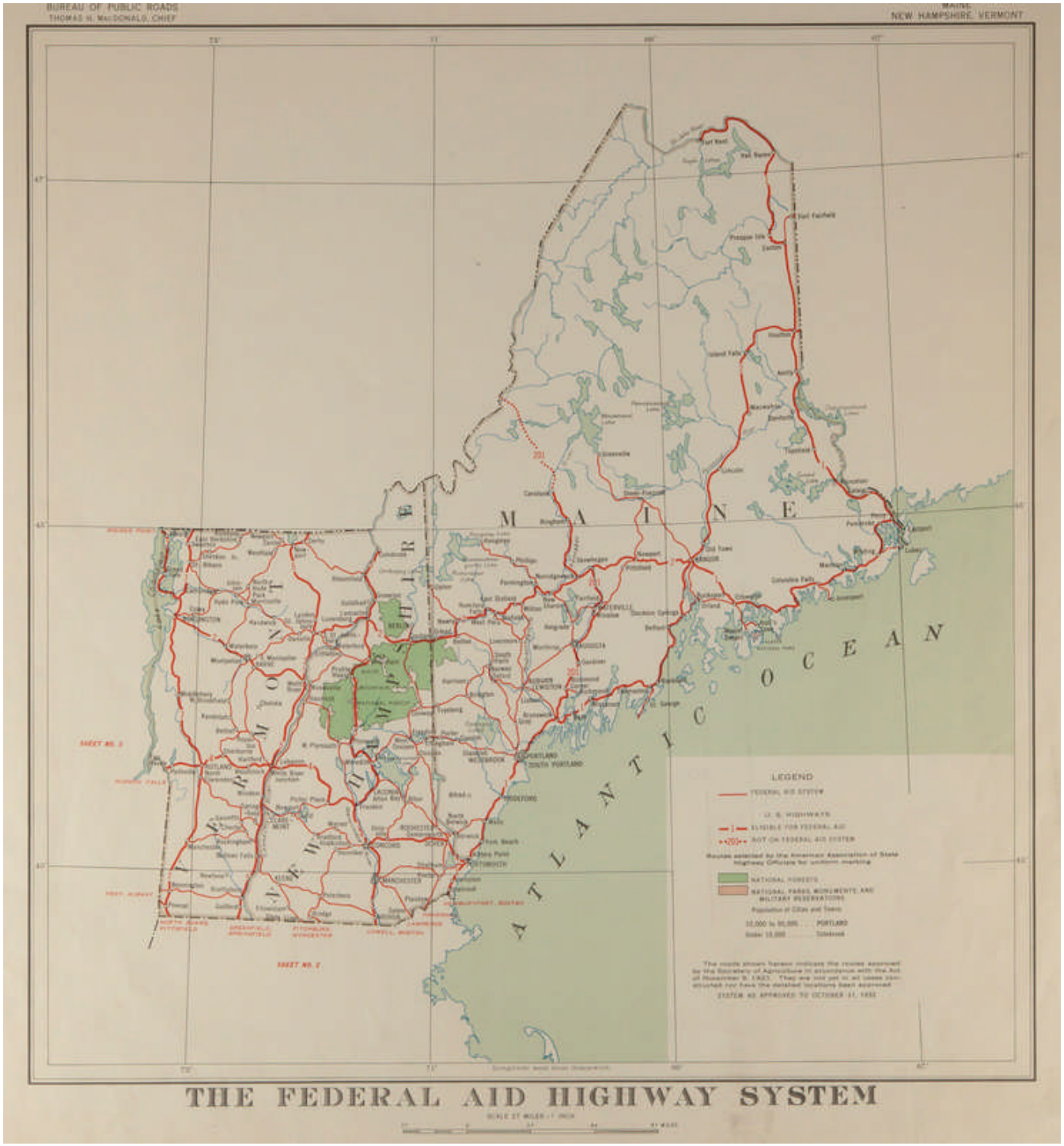

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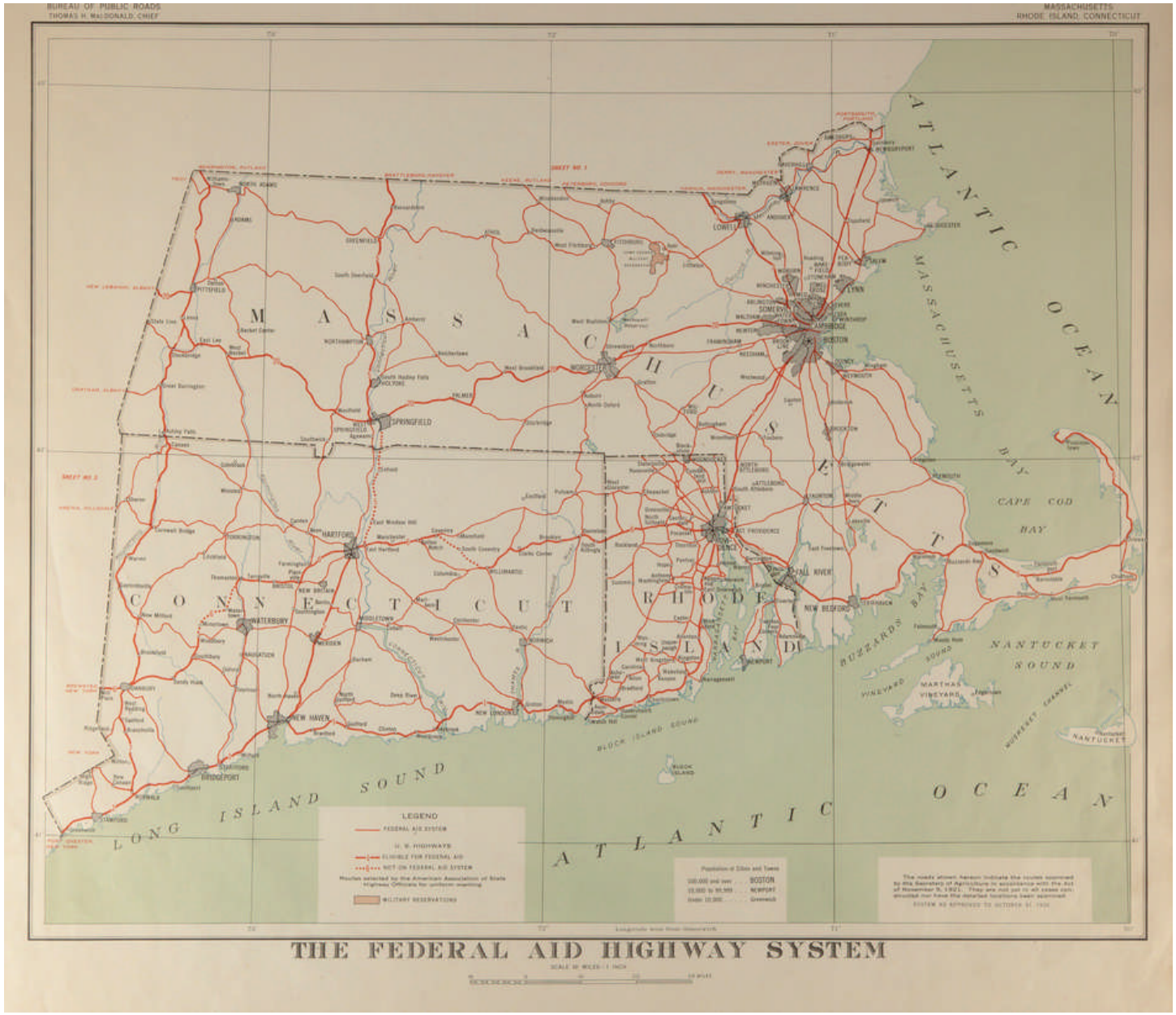

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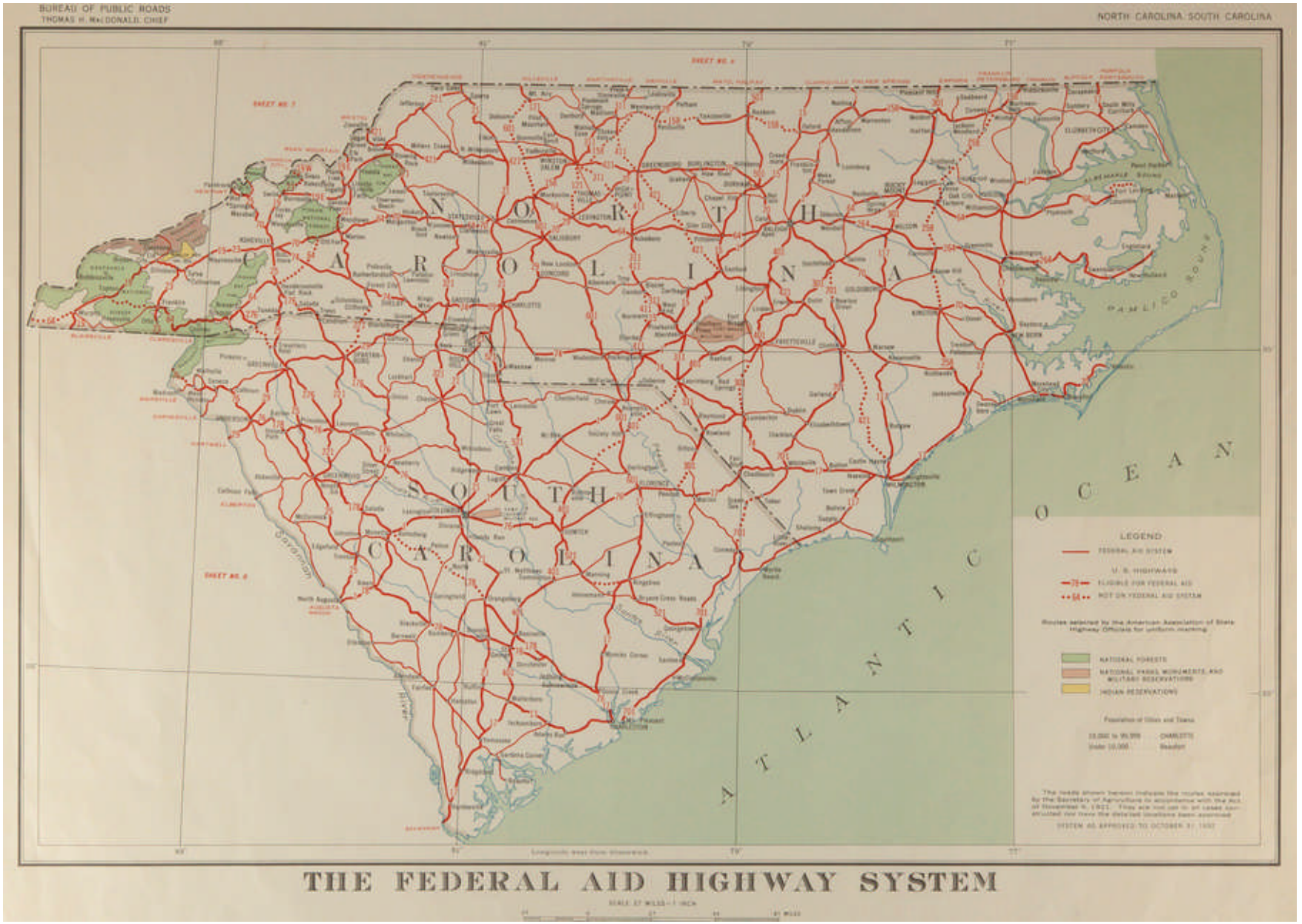

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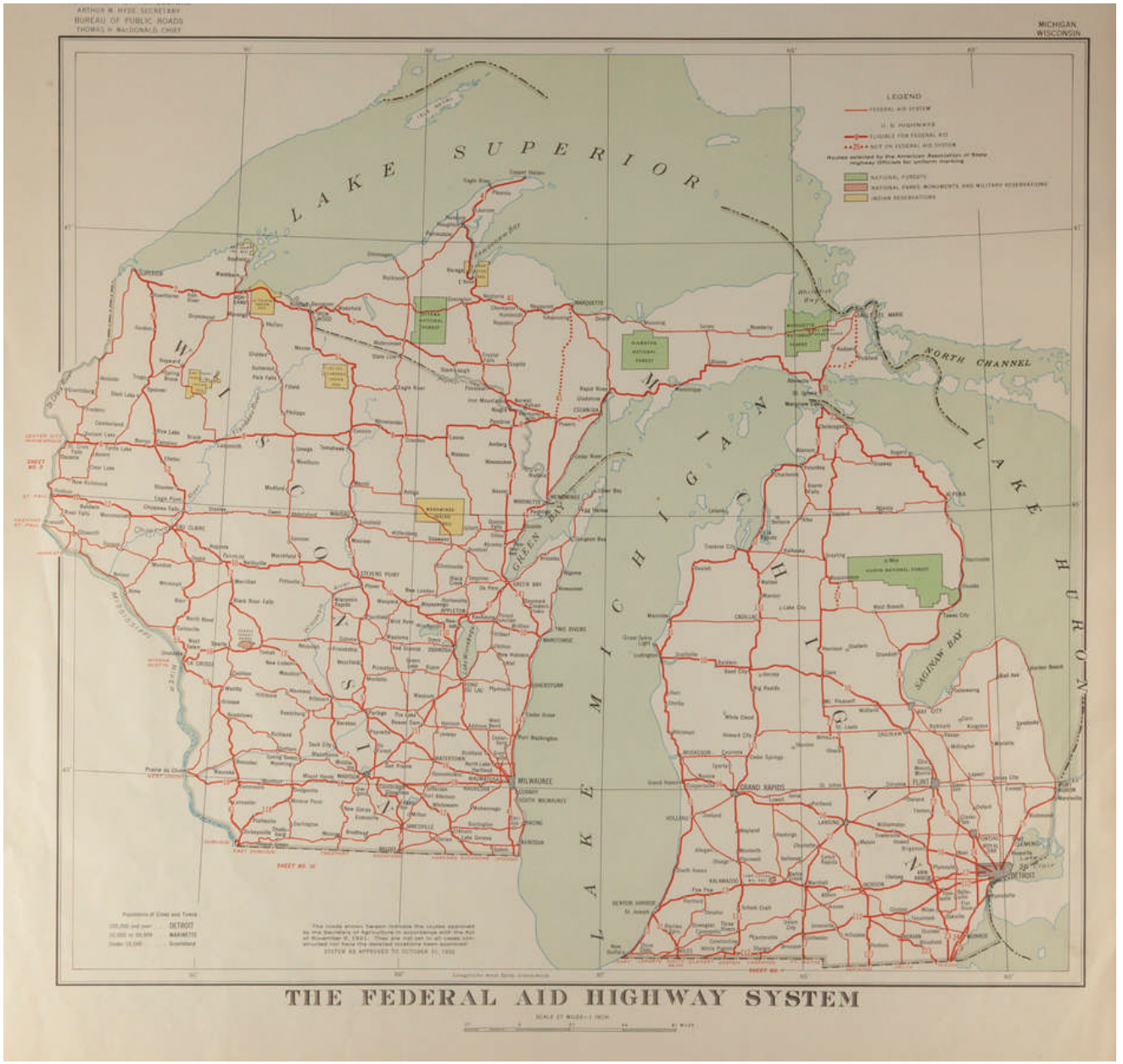

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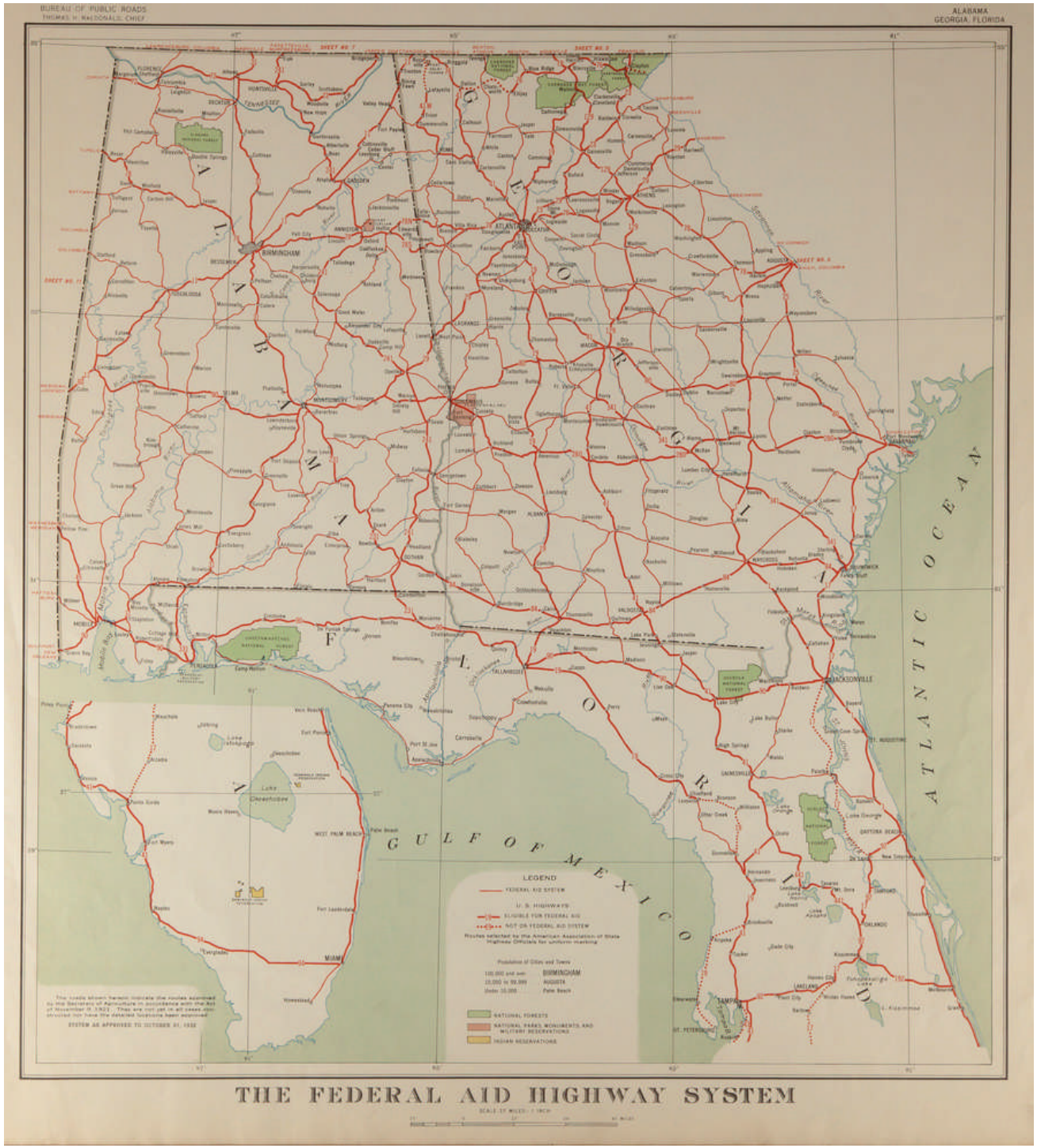

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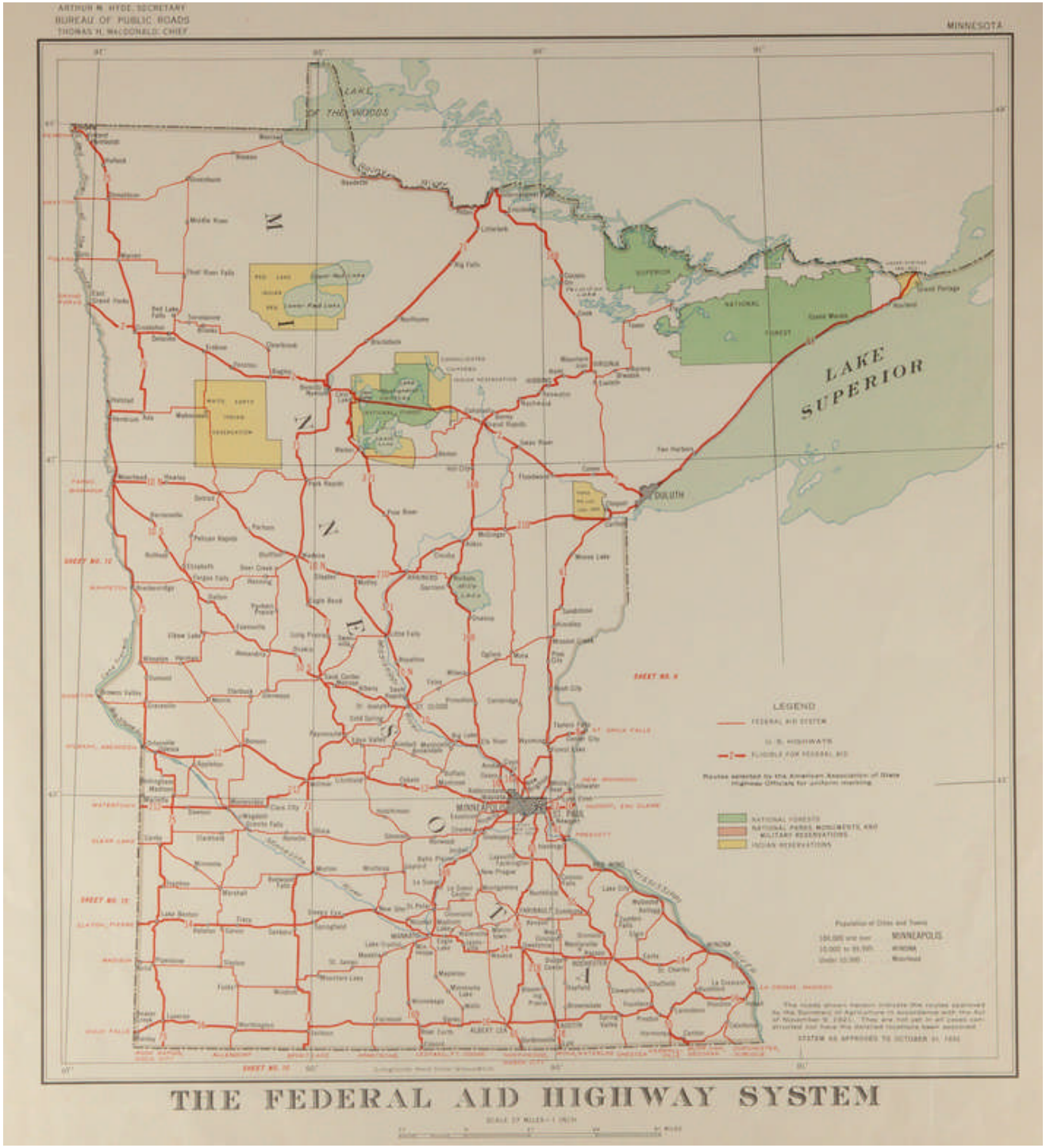

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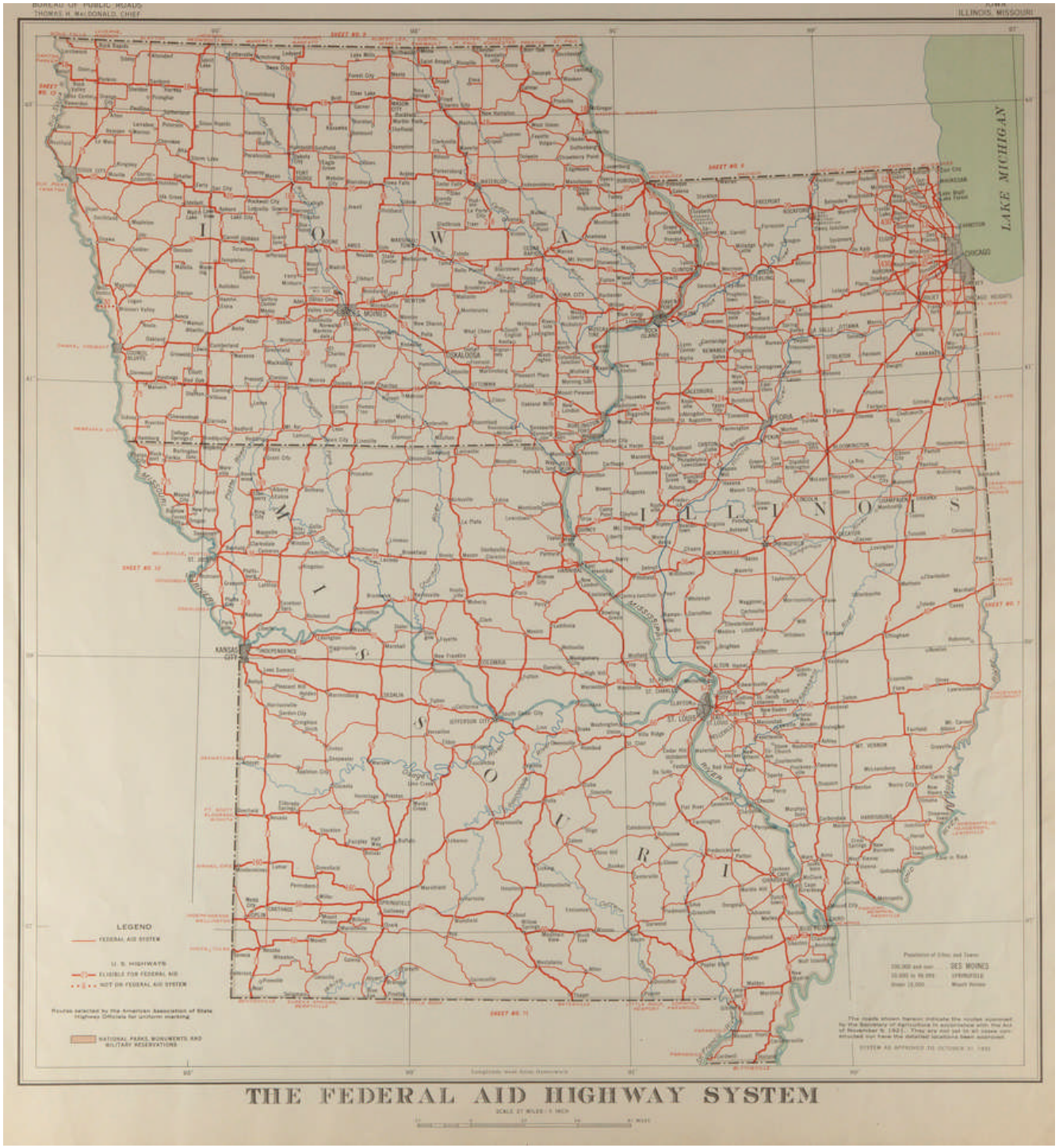

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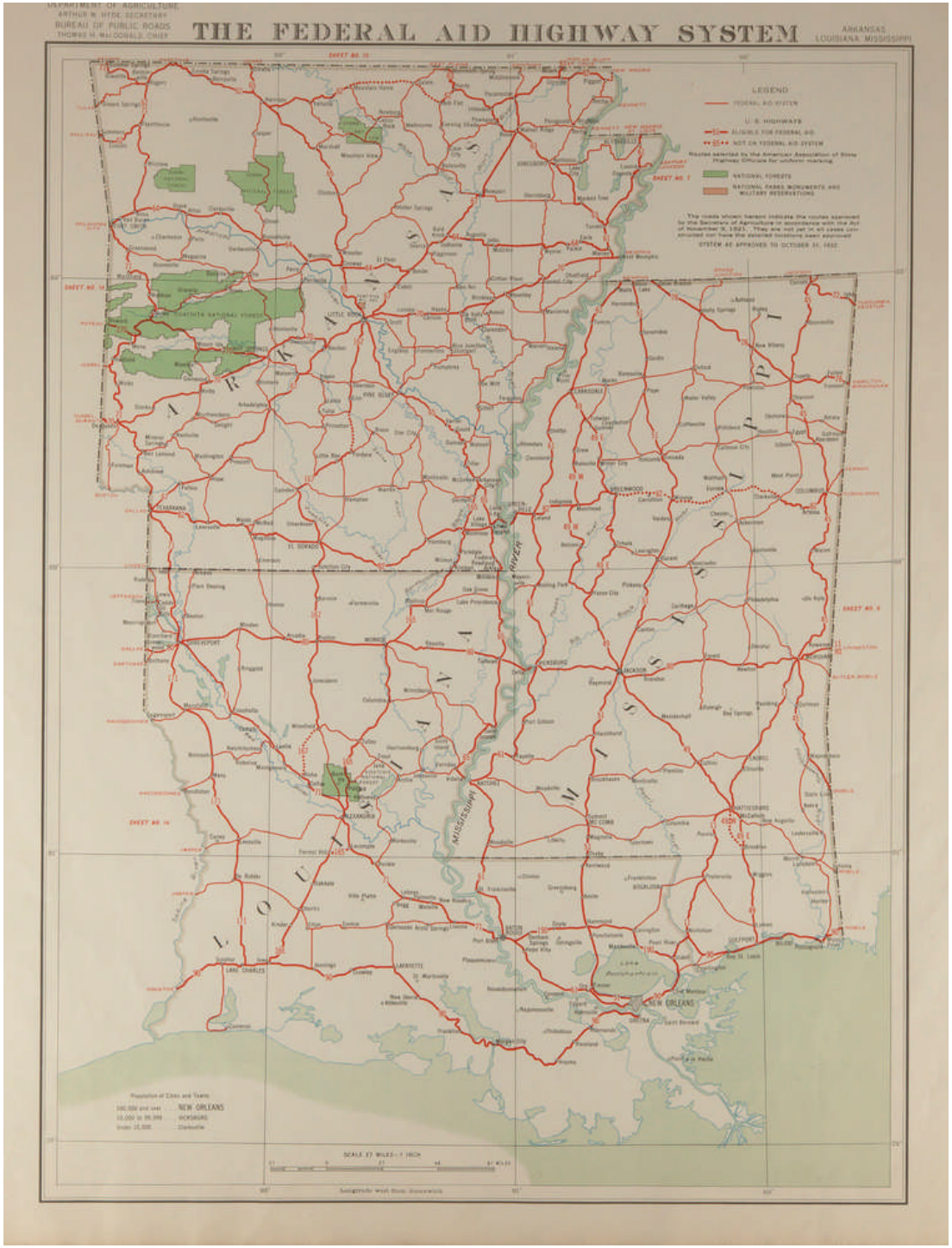

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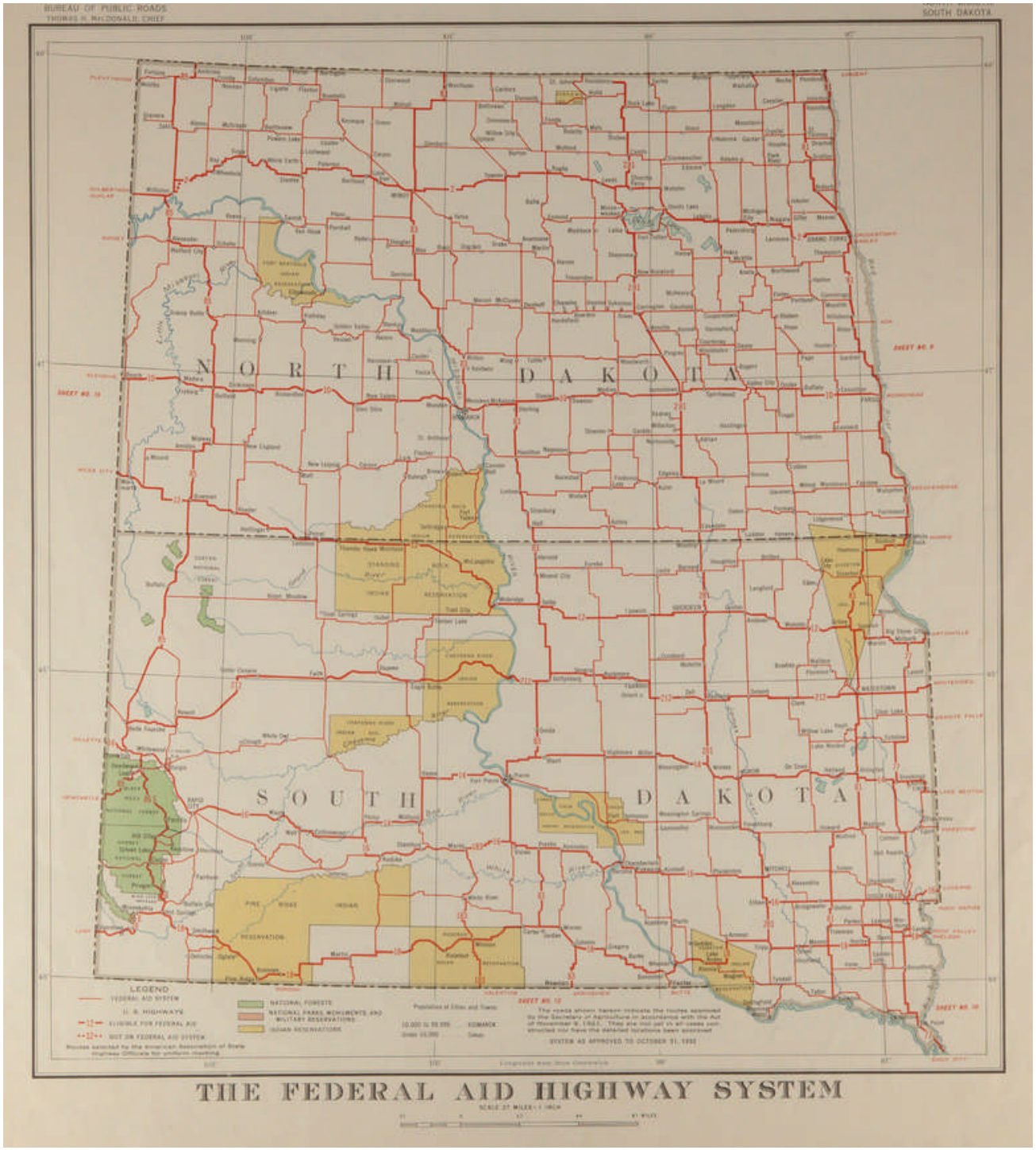

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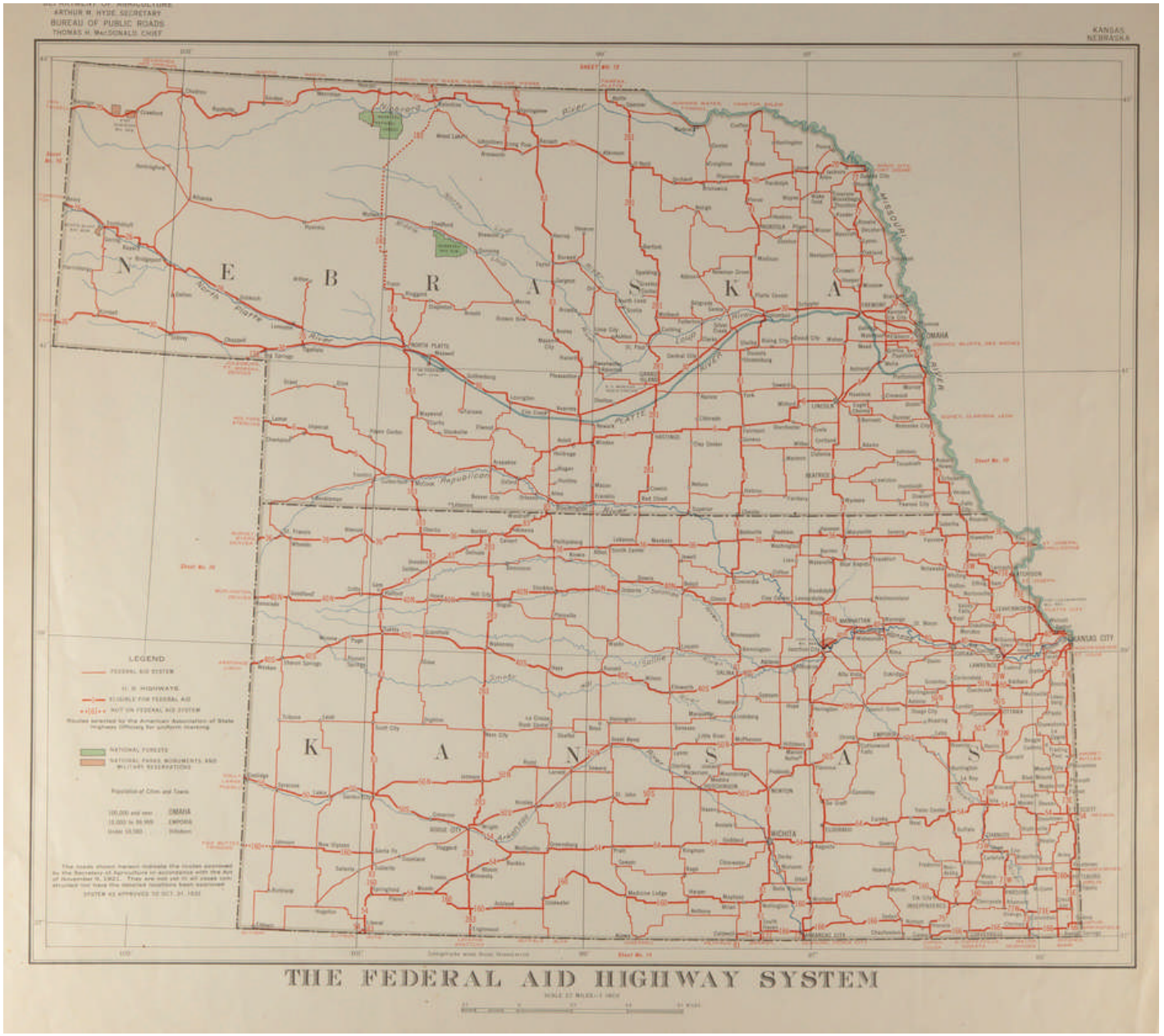

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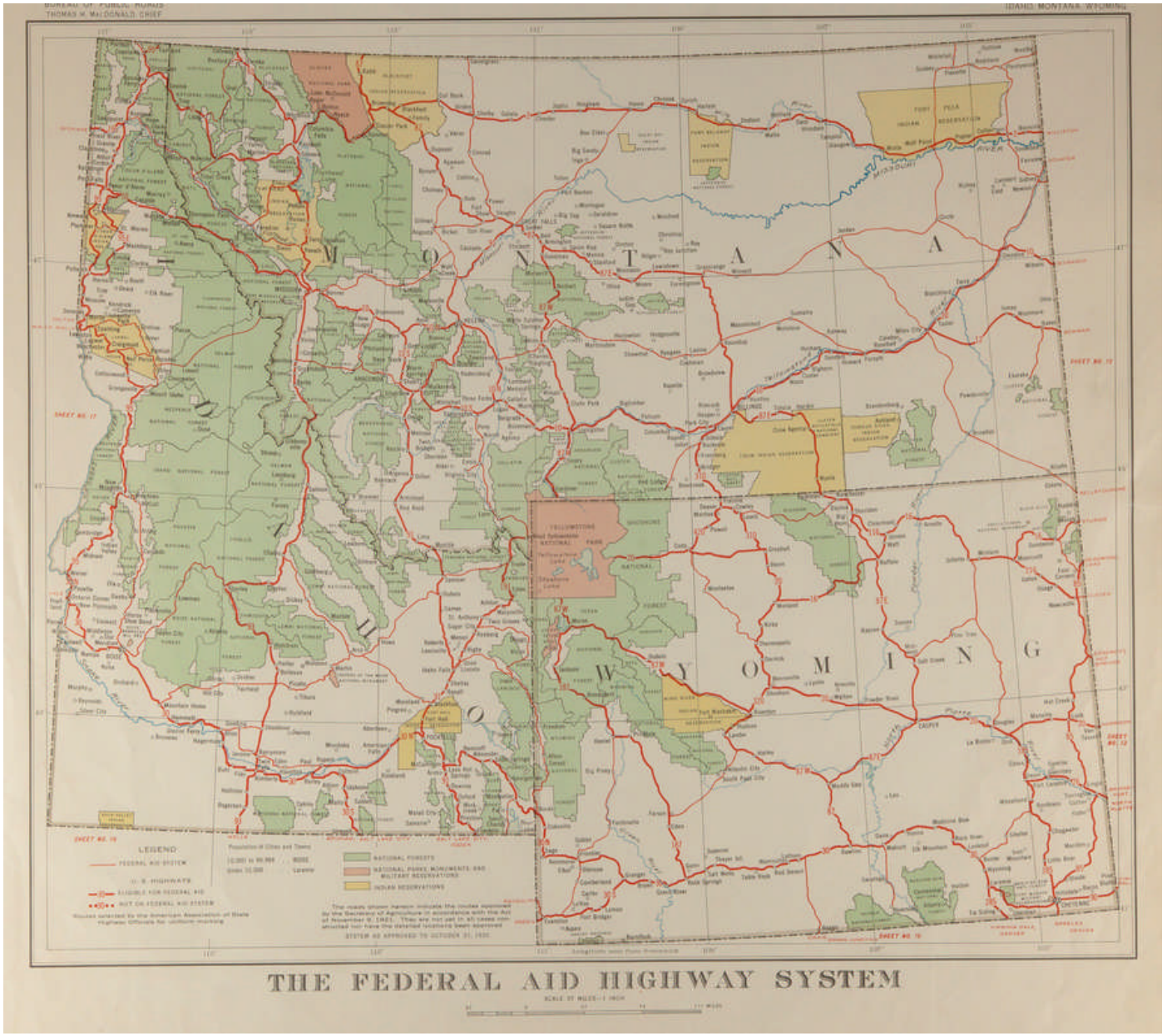
Section 14: Texas & Oklahoma



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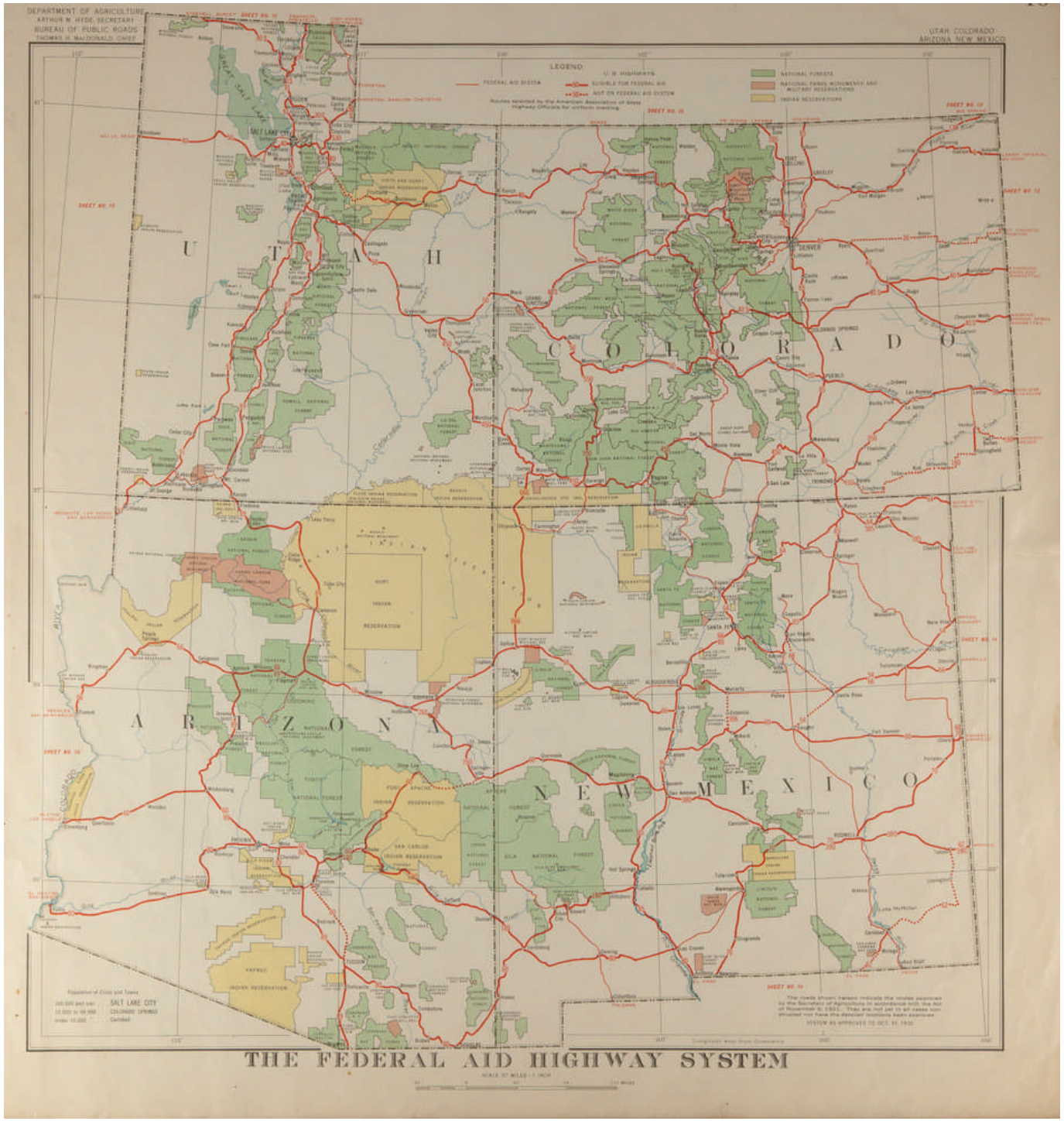

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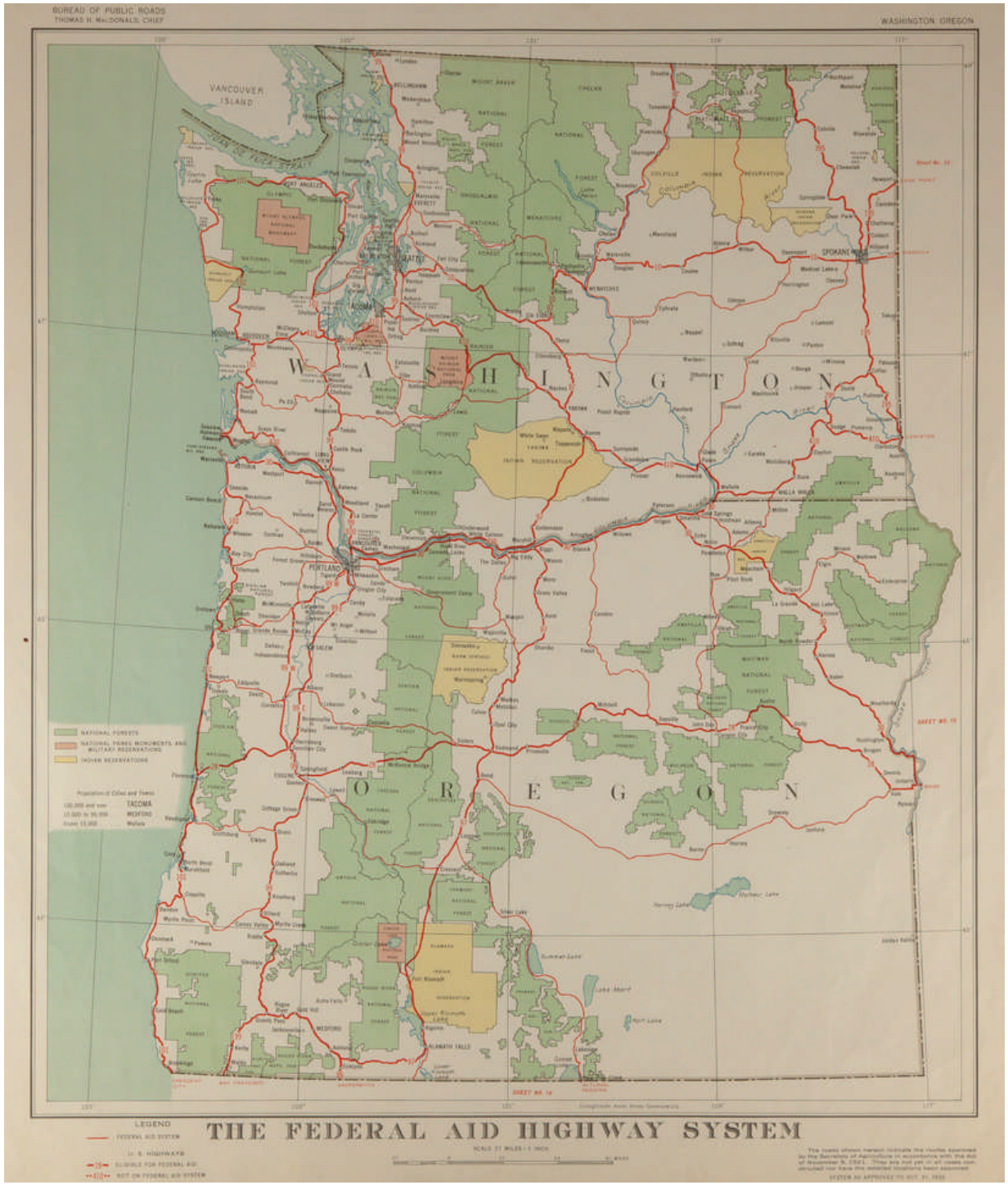

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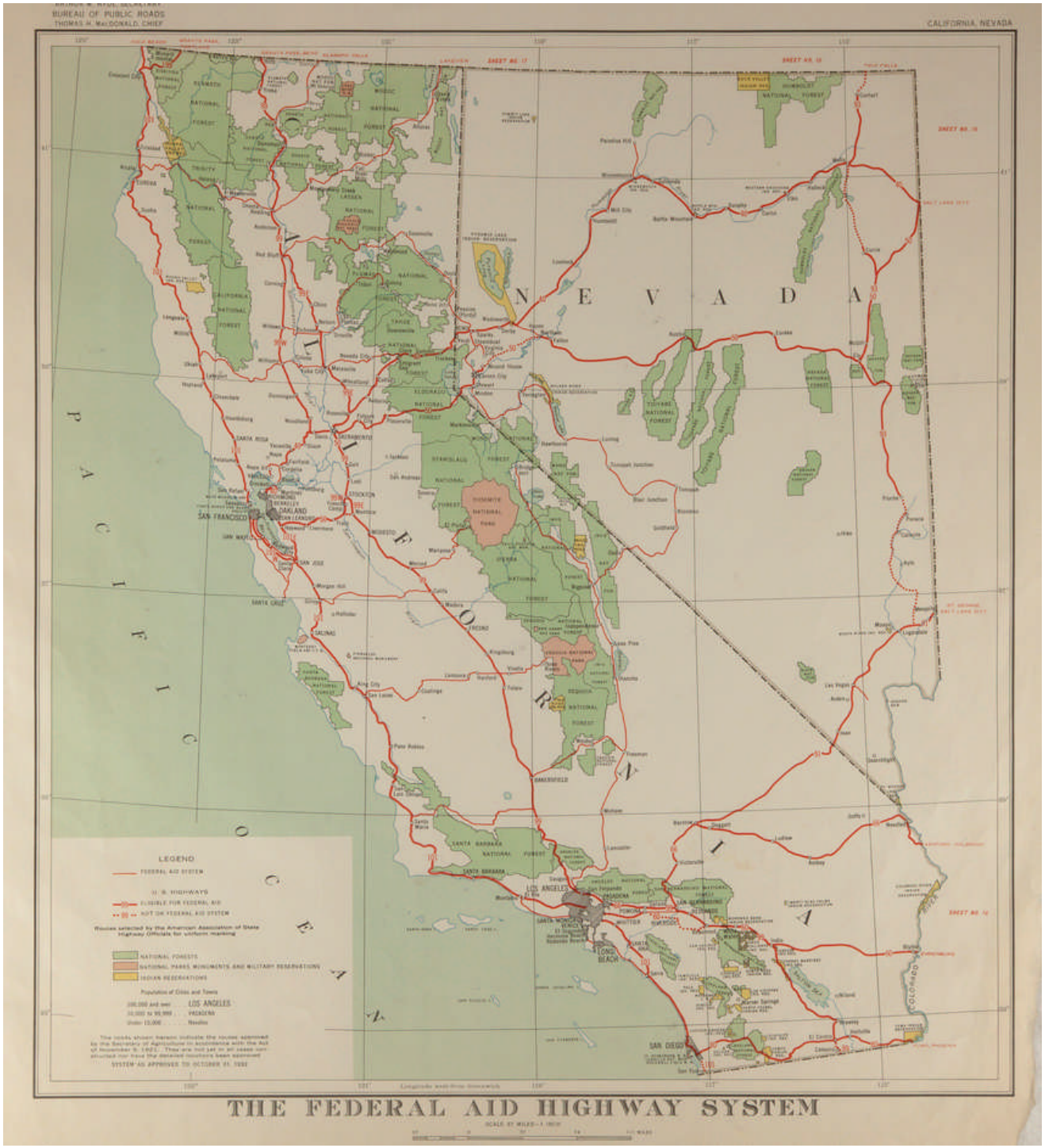
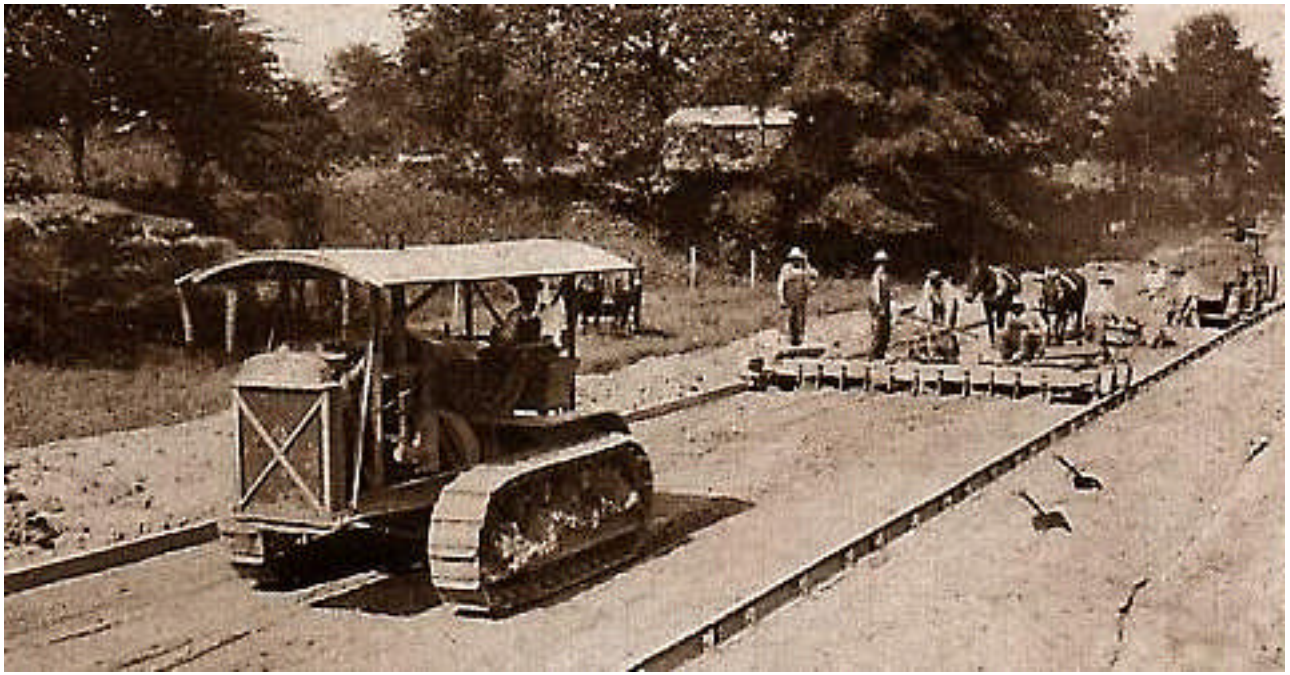


Section 18: Nevada & California

"The State Highway Officials are greatly concerned that no provision has been made by the Federal Government for the continuance of the highway policy of cooperation between the States and the Federal Government that was adopted in 1916 and has been in continuous effect now for 17 years. Neither has any provision been made for continuing the work on public roads through the national forests, parks and other public lands. Each Congress since 1916 has provided for the continuance of the Federal aid program for a two-year period until the Congress which has just adjourned which provided no such legislation…The position of the State Highway Officials is further jeopardized at this time by the very large diversion of revenues from the gas taxes and license fees, heretofore devoted to roads, which have been commandeered for other purposes. One of the potent arguments advanced for these diversions in many States has been the fact that no Federal aid legislation had been provided to insure the continuance of the cooperative program…The withdrawal of the Federal Government definitely from this field, even temporarily, will mean a further diversion of the funds coming from the gas tax and motor vehicle license fees to other than road purposes…"

***American Highways,* April 1933**

Make Work



"...In determining this important question of public policy - the place of road building as an agency of employment during the depression - we must not lose sight of the central fact that it is imperative for the future of our American civilization to replace the dole with work, and that of all the means of providing work (other than the normal upward swing of the business cycle, which puts workers back on their normal jobs), road building is from almost every standpoint the most satisfactory…In addition, there is the possibility so often discussed, of constructing a series of national super-highways, from east to west and north to south, perhaps with separate lanes for high-speed traffic and heavy slow-moving trucks…"

***Grover C. Dillman,* Michigan State Highway Commissioner (January 1933)**

<u>Above</u>: caption: "In 1930, an American road crew builds a concrete highway. Notice the use of horse power."

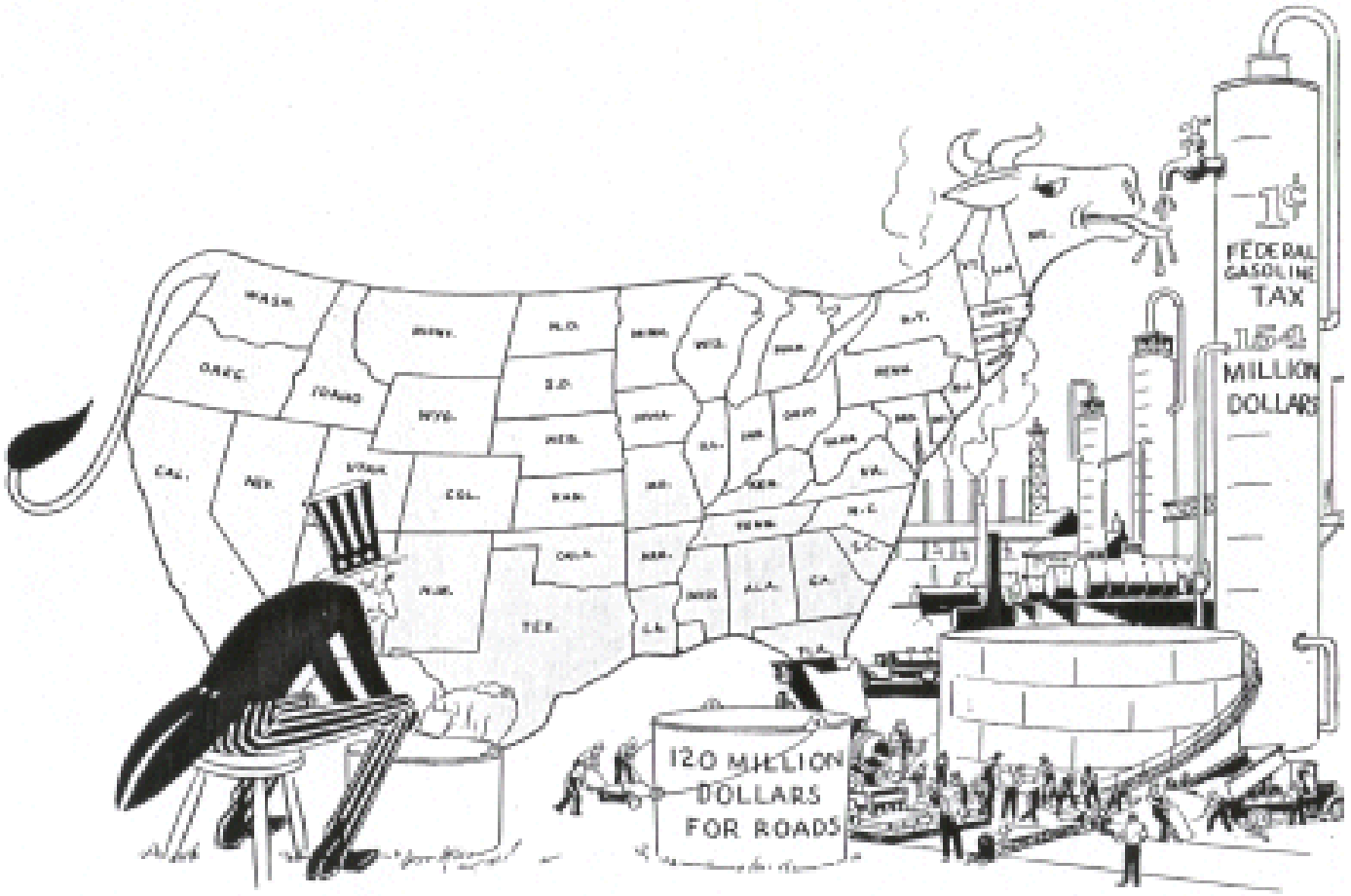
After a long period of silence (attributable to the change of presidential administrations), BPR Director McDonald presented the details of the "National Industrial Recovery Act" (NIRA) in an article appearing in the December 1933 issue of *ENR.* The $3.3 billion program was well developed and on its way to passage when AASHO officials persuaded *Congress* to deliver $400 million through BPR. Some of the rest of the $3.3 billion found its way into highway projects at the municipal and/or county level/s. The order of priority included the following:

- **Closing gaps in the Federal Highway System;**
- **Landscaping of Parkways and roadsides;**
- **Supplementing existing transportation facilities;**
- **Elimination of highway hazards to traffic**

In January 1934, BPR Director MacDonald presented statistics to a conference of the *American Road-Builders' Association* (ARBA) to show that the NIRA program had begun building the equivalent of three transcontinental highways in the period extending from July 1933 to January 1934, creating 132K jobs in the process. However, the results of the emergency program were devastating to state highway departments. The 100% Federal share of funds accelerated the diversion of state highway-user revenues because, as the state legislatures saw it, the highway departments had no need of state revenues since they had more Federal money than ever before and no need for matching funds. Vast mileages of minor roads were transferred to state jurisdiction without any revenue to go with them because that's where the 100% Federal money was allocated and tax revenues were drying up. The emphasis on labor intensive projects on minor roads completely inverted the economic efficiency that had prevailed in the pre-depression days of the Federal-aid highway program. Thus, the main coast-to-coast routes suffered at the expense of minor projects. The funds, although they generated employment, did not provide nearly as much as if the regular Federal-aid (50-50) matching program had been in place. This dilemma would lead to the passage of the *Hayden-Cartwright Act* in 1934 which provided for a return to the regular program in 1936. A specific section of the Hayden-Cartwright Act would prohibit rampant diversion of Federal highway funds by the states.

"…The most striking trend indicated by the figures is the drop in employment on independent State construction. In this connection it is to be noted that the decline in State contribution to construction has been even greater than these employment figures would suggest, on account of the fact that in 1931 the States bore the expense of a considerable portion of the employment attributed to Federal and Federal-aid work whereas in the succeeding years they have contributed in progressively smaller percentage. The transfer of State support from construction to maintenance work as Federal funds have been supplied to carry the construction cost is also one of the notable indications of this employment record. But the salient point is the evidence that the additional provision made for highways during the period by the Federal Government has been offset by withdrawal of support by the States. It is important that these facts be generally understood at this time because the Federal Government has given notice in the Hayden-Cartwright Act of its intention hereafter to return to the Federal-aid plan of contribution to road work. That plan will substitute for the direct grants of the recent past, a shared expenditure, which will impose upon the States an equal obligation. The contemplated Federal contribution will be considerably less than those of the past year or two. Therefore, if a material reduction of the highway program is to be avoided it will be necessary that the States return to the work at least the measure of support they recently have withdrawn from it. In the light of the figures presented in the employment tables, the wisdom of the provision of the Hayden-Cartwright Act that seeks to halt further diversion of motor vehicle revenues from road work is apparent."

Contractors and Engineers Monthly, **December 1934**



AND YET "UNCLE" HAS 34 MILLION DOLLARS OF STRIPPINGS LEFT

"…The traveler by highway may yet see highway developments that will be conceived on an interstate or a national basis. Such development is indicated along intercity roads where population density and traffic point to the necessity of a moderate program of new highways or parkways caring for recreational travel of a character now denied to the traveler upon our most heavily traveled roads…"

***T.H. MacDonald,* BPR Director (August 1935)**

RE: during the depression years of the mid-1930's, the movement advocating the building of "Superhighways" was in its heyday. The building of roads through state highway departments simply did not create the public perception that the Federal Government was doing all it could to relieve the chronic unemployment still prevalent. No less a figure than FDR himself came to believe this. Despite the long list of initiatives of the Roosevelt Administration, the unemployment rate never went below 17% until 1939 when armament production began to stimulate the national economy.

"Proposals for a new form of empire building - a network of superhighways have been seriously considered by President Roosevelt in connection with the $4,880,000,000 works program, it was reported yesterday. The President, it was learned, has discussed with congressional advisers the possibility of using a substantial portion of the works fund, now awaiting Senate passage, to link the country's international boundaries with smooth, arrow-straight four-lane thoroughfares. Tentative plans call for three of the master roads connecting the Atlantic and Pacific coasts and two others stretching from Canada to Florida and Mexico. Nearly every State would be crossed by one of the roadways in this vast mosaic pattern…President Roosevelt displayed what friends described as 'uncanny knowledge' of American geography in discussing the new traffic arteries. Outlining a suggested southern route, he glanced slyly across his desk at Vice President Garner and quipped; 'We'll have to cut this highway short because Texas is impenetrable.' One of the President's advisers got the impression the right-of-way would be half-a-mile wide. When the plan was in an embryonic stage last fall, however, Secretary Ickes fixed the width at 1,000 feet and suggested the roads should be landscaped until they were the most beautiful in the world..."

***The Washington Post,* February 20th 1935**

"President Roosevelt said today that he approved the proposal of Senator Robert J. Bulkley, of Ohio, that the Federal Government set up a public corporation to build 10 self-sustaining transcontinental highways as a national-defense and business pump-priming measure. The President revealed that he was studying the possibility of putting such highways on a self-liquidating basis by charging tolls and disposing of excess lands taken in condemnation. The plan the President is said to have in mind contemplates condemning not merely a right-of-way for the highways but abutting land to a depth of one mile on either side of the highway itself. This highway frontage, which presumably would increase in value by reason of its newly acquired accessibility, the Government would dispose of at a profit which would help defray the cost of the projects. The President argued that private owners through whose land a public highway might run were not entitled to the chance profit arising from the accessibility conferred with the action of the Government. He cited the case of a farmer in the southern end of Columbia County in New York, who was paid $2,000 by the State of New York for a right-of-way through his farm. This, he said, was half the original cost of the farm. The farmer, taking advantage of the two new highway frontages, split his holding into three parts and sold them for a total of $6,000. It was his thought, the President said, that the State or Federal Government in the case of the projected transcontinental highways, was entitled to the increment in value from highway improvements. This could be realized, he explained, if the Federal Government acquired considerable land on either side of the projected highways, at a fair value and resold it at a profit. Whether new legislation would be required to give the Government this power to condemn in excess of actual needs, the President said, was one of the phases of the proposal to which he is giving study."

***New York Herald Tribune,* February 16th 1936**

The Urbanism Committee

"…The principal problem at present is how to control and manipulate the existing transportation network either to preserve or to reshape the existing national urban pattern and the urban community or region. Instead of utilizing the transport system and the rate structure to influence the flow of goods and people, and the distribution of economic activity and urbanization according to some previously conceived national plan of development, we have permitted our transport facilities and rate structure to accentuate existing advantages and disadvantages. A new policy must be adopted, designed to make our transport system and rate structure a flexible tool instead of a rigid cast for future urban development…"

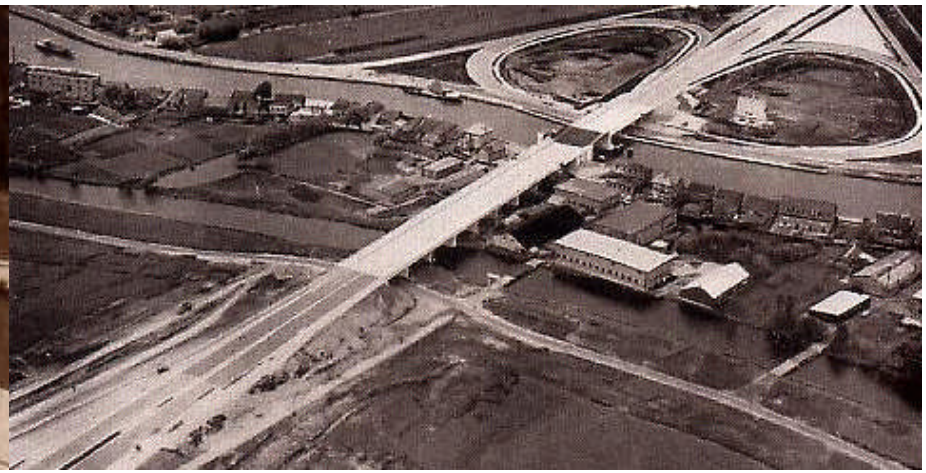
RE: excerpt from a 1937 report to President Roosevelt by the *Urbanism Committee*, a subgroup of the *National Resources Planning Committee* (forerunner of the *National Resources Planning Board*). By the 1930's, formalized city planning at the national level would be a major contributing factor to the creation of the *Interstate Highway System*. Shortly after this report was published, a Federal "Urban Renewal" program was established.

President Roosevelt was a strong advocate of Federally constructed national coast-to-coast highways and was quoted widely in the press and discussed such a proposal on more than one occasion with selected groups of Congressmen. No less than fourteen bills to build such a system were introduced with at least two sponsored directly by the administration. In parallel, there was a growing concern for the condition of the cities. The migration from rural to urban had reached alarming proportions by the mid-thirties. It was the wisdom of the times that the rural environment was wholesome and that the cities were moral wastelands. Thus, decay of central cities was becoming endemic. FDR established the *National Resources Planning Committee* (NRPC) to study national problems and the *Urbanism Committee* (UC) to look into the urban problem. "Our Cities" (published in 1937) dwelt heavily on city planning as the way to solutions and the use of highways as a tool for change since it envisioned the public rebuilding (a.k.a. "Urban Renewal") of blighted areas. *Congress* ordered BPR to study the national toll road problem in 1938 as a reaction to all of the pressure for legislation. BPR prepared a comprehensive response using for the first time the results from the planning survey studies.

A Fantasy in Concrete

"…I was in Germany this summer and when I think of super-highways, I think of Germany, for, regardless of what we think of him as a man, we must give Fuehrer Hitler credit for building a system of super-highways in his country which are second to none in the world today. It is undoubtedly true that the construction of these highways was prompted by the same motives which are behind Germany's huge expenditures for armament and for the building up of her army to the limit of her manpower. The super-highways will become very important assets to that nation in the event of another war in Europe. In the meantime, however, they are providing the German people with innumerable peacetime commercial, industrial, social and cultural benefits. I think that the United States should have a highway system second to none. Our highway engineers such as Thomas H. MacDonald and Charles M. Upham have long served as teachers to road builders in other parts of the world. The safety features which are built into the German super-highways are, in fact, those which have long been recommended by American engineers. The world's best and most efficient road-building machinery and materials are manufactured in the United States. Our financial structure is certainly superior. It is , therefore, not an idle boast for us to say that we can do better anything that Germany can do well. However, I do not advocate that we start immediately to construct a super-highway system like that in Germany. It would take many years to build a complete system which would link the entire country and cost billions but we can begin now to design and lay out this system and to construct super-highways in those areas where traffic is heavy and congested. In this way we will be able to attain, in the next decade or so, the beginnings of a system of highways and super-highways which will be adequate for the needs of our country."

Representative *Wilburn Cartwright*, Chairman of the House Committee on Roads
RE: excerpt from a speech to the annual meeting of the AASHO in December 1938



Until the 1920's, America's road builders could only dream of equaling Europe's achievements. Then, as the *United States* embarked on one of the greatest road-building periods in history, the country's road builders began to lose their underdog status. The "Reichautobahnen" (National Auto Roads), Germany's network of motorways, incorporated the most advanced design principles in the world. America's highway leaders visited *Germany* throughout the 1930's to see what one writer would later call: "a fantasy in concrete." The tours, often accompanied by Hitler's chief engineer *Dr. Fritz Todt*, included travel on the *Autobahn* and an overview from one of Germany's famous Zeppelin airships. BPR Director *T.H. MacDonald*, addressing a meeting of the *American Automobile Association* (AAA) after returning from *Europe* in 1936, acknowledged Germany's "magnificent conception of a national system of major highways." However, in bypassing the cities (as the Autobahn did) he said "something is lost."

Left: caption: "A Fantasy in Concrete – Germany's Autobahn"

Right: caption: "This view taken in 1938 of the Hague-Utrecht motorway in The Netherlands shows that in addition to Germany, other countries in pre-World War II Europe had excellent highways."

"…The system of German roads is being built in advance of, and to promote the development of, highway transport. In the United States the situation is just the reverse. Highway builders are proceeding on the principle that the utilization of the highways must produce directly the revenues with which to finance their construction. As long as the United States adheres to this method of financing, the building of super-highways must be limited to areas where the present and prospective traffic will justify it. As a trend of highway development, it is apparent, from the important beginnings already made, that a considerable mileage of motor super-highways will be developed, that their location will be carefully integrated with the population centers, and that the layout will not be on the transcontinental basis. From the development abroad and in the United States, one can conclude that super-highways will be created, but only in the vicinity of metropolitan areas and for connecting those that are separated by relatively short distances. The first function has already been served to a considerable extent by parkways. It is logical that there will be further developments of the type of the Blue Ridge Parkway designed to connect the Shenandoah and the Great Smokey Mountain National Parks. The development of such parkways recognizes the large use of motor vehicles for recreational purposes…"

***T.H. MacDonald,* BPR Director, July 1937**

Toll Roads and Free Roads

"The Chief of the Bureau of Public Roads is hereby directed to investigate and make a report of his findings and recommend feasibility of building, and cost of, super highways not exceeding three in number, running in a general direction from the eastern to the western portion of the United States, and not exceeding three in number, running from the northern to the southern portion of the United States, including the feasibility of a toll system on such roads."

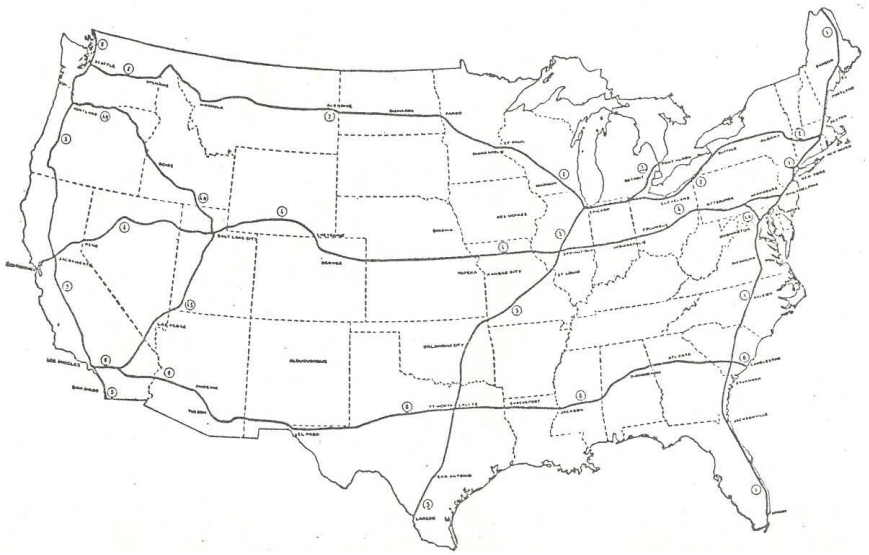
RE: excerpt from Section 13 of the *Federal Highway Act of 1938*. In the 1930's, there was a strong "Superhighway" movement and POTUS *Franklin Delano Roosevelt* was one of its main advocates. In fact, legend has it that the *Interstate Highway System* began with FDR drawing three lines east and west and three lines north and south on a map of the *United States* and asking the *Bureau of Public Roads* to build it.

"…It is as clear as daylight that, to bring about any sort of recovery, somebody must start some new sort of business or some extension of an old business. It is also clear that nobody is in sight right now who has any notion of doing that - at least not in time to do this country any good as a depression cure. There is one business which is a public business but is also a private one. This is the road-building business. The Government pays for the roads and hires the contractors. But the roads are built usually by private contractors and with materials furnished by private manufacturers. If there is one thing needed in this country now, in view of the development of the automobile, it is express highways running east and west and north and south. Why, therefore, cannot the Government go into the business of building these highways? They would cost a great deal of money. It would probably be possible to spend a billion dollars in a year on such a project, perhaps more. The money to build them could be provided by the issuance of Government bonds. But they would be self-liquidating bonds. No such roads should be built without at the same time establishing a toll system to carry the interest load and maintenance charges and to pay off the principal over a moderately short period of years…the enterprise should be put under the direction of the biggest, ablest, strongest man the President could find, whose ability to resist political and business corruption is known - a man like Bob Moses of New York. Who can doubt that this would be infinitely better than building battleships and machine guns?"

***Washington News*, February 9th 1938**

"…Class I, National Superhighways, should comprise a system of direct inter-regional routes, following the alignment and incorporating the improvement of existing highways wherever feasible, but departing from existing roads wherever necessary to obtain direct alignment and high standards of curvature and gradient. Such a system may be limited to not more than 1 percent of the total mileage of all highways and roads in the United States, but it should be unlimited as to mileage in each State. Such a system would serve approximately one-eighth of the total traffic moving over all rural highways. It would include all of the important lines of long distance travel and, except for short sections radiating from the larger cities, all of the roads on which there is, at present, an approach to congestion of traffic…The Class II State highway system was discussed and would have been limited to 10% of total mileage. Class III would also have been limited to 10% of total mileage in each State. Class IV would have been selected from the remaining roads but limited to 20% leaving 60% not eligible for Federal aid and, the recommendation was, a significant portion of that should be abandoned…Both the proposed National Superhighway System (Exhibit G) and the proposed toll road system (Exhibit A) have been discussed informally with officers of the War Plans Division of the General Staff of the Army, eliciting comment indicative of pronounced military preference for the larger system…"

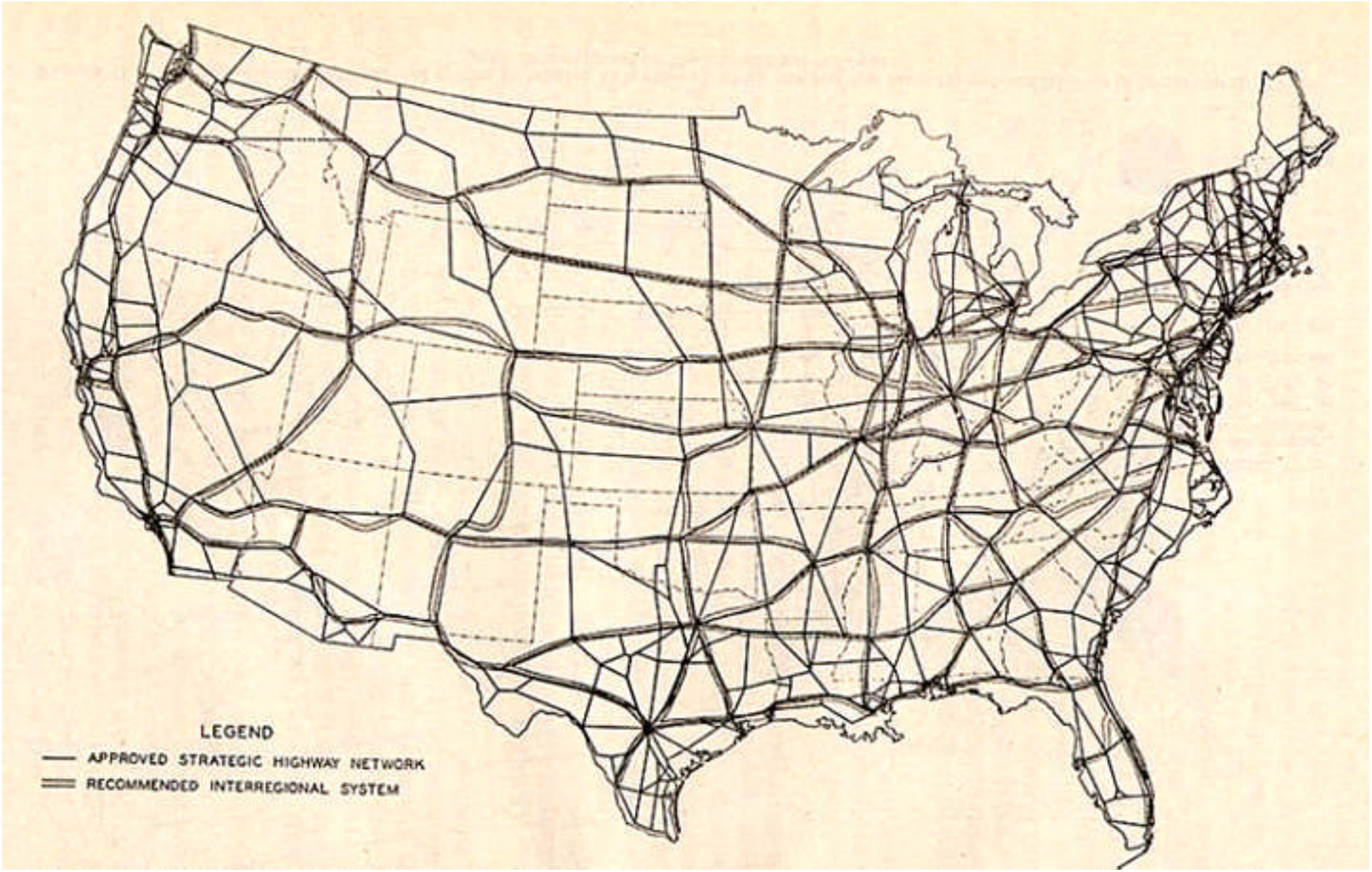
RE: excerpts from part one the 1939 BPR report which came to be known as "Toll Roads and Free Roads"



<u>Above</u>: caption: “Location of toll-road routes selected for study, 1938” (“Exhibit A”)

<u>Above</u>: caption: “Proposed inter-regional (toll-free) highway system, 1939” (“Exhibit G”)

BPR Director *T.H. MacDonald* was appointed chairman of the *Interregional Highway Committee* (IHC) whose mandate was to expedite the implementation of the *Toll Roads and Free Roads* program (1939). The President's charge to the IHC was to report to him by October of 1941. With the outbreak of war, the work of the IHC languished. In July 1943, *Congress*, seeking a post-war highway program: *"Authorized and directed the Commissioner of Public Roads to make a survey of the need for a system of express highways throughout the United States, the number of such highways needed, the approximate routes which they should follow, and the approximate cost of construction, and to report to the Congress within six months..."* By early 1943, the highway program was effectively shut down. Money was available from past apportionments, but it couldn't be used because approval to build was granted only if the *War Department* certified that the project was essential to the national defense and the *War Production Board* agreed to grant a priority so that scarce materials could be obtained. The production of automobiles had been suspended, tires and gasoline were rationed and a 35 mph speed limit was in effect. Both in AASHO and Congress, thoughts were turning to the development of a post-war highway program.



<u>Above</u>: caption: "Relation of the recommended interregional system of thestrategic network of principal routes of military importance approved by the Secretary of War, as revised May 15, 1941"

Highways for National Defense

"...When the history of this war period is carefully reviewed, I am convinced serious students will certainly question why such meager provision has prevailed for the maintenance and replacement of the facilities and plants of land transportation which is so essentially a part both of war production and war operations, disregarding the added factor of preserving the civilian economy...the next months must produce increased allocations of the requirements to serve land transportation, both rail and highway...The rapidly dwindling construction program is indicated by the following figures showing the comparative highway system mileage placed under construction with cooperative Federal funds, in the first ten months of this and the previous three years:

1940.....11,842.6 Miles

1941.....8,645.4

1942.....1,869.2

1943.....722.4

If this situation continues, the reservoir will soon be dry…"

***T.H. MacDonald,* BPR Director (December 1943)**

<u>Above</u>: caption: "Highways for National Defense Advertisement, 1940. This advertisement appeared in a 1940 edition of California Highways and Public Works."

<u>Above</u>: caption: "Routes of the recommended inter-regional (toll-free) highway system, 1943"

Post-War Worries

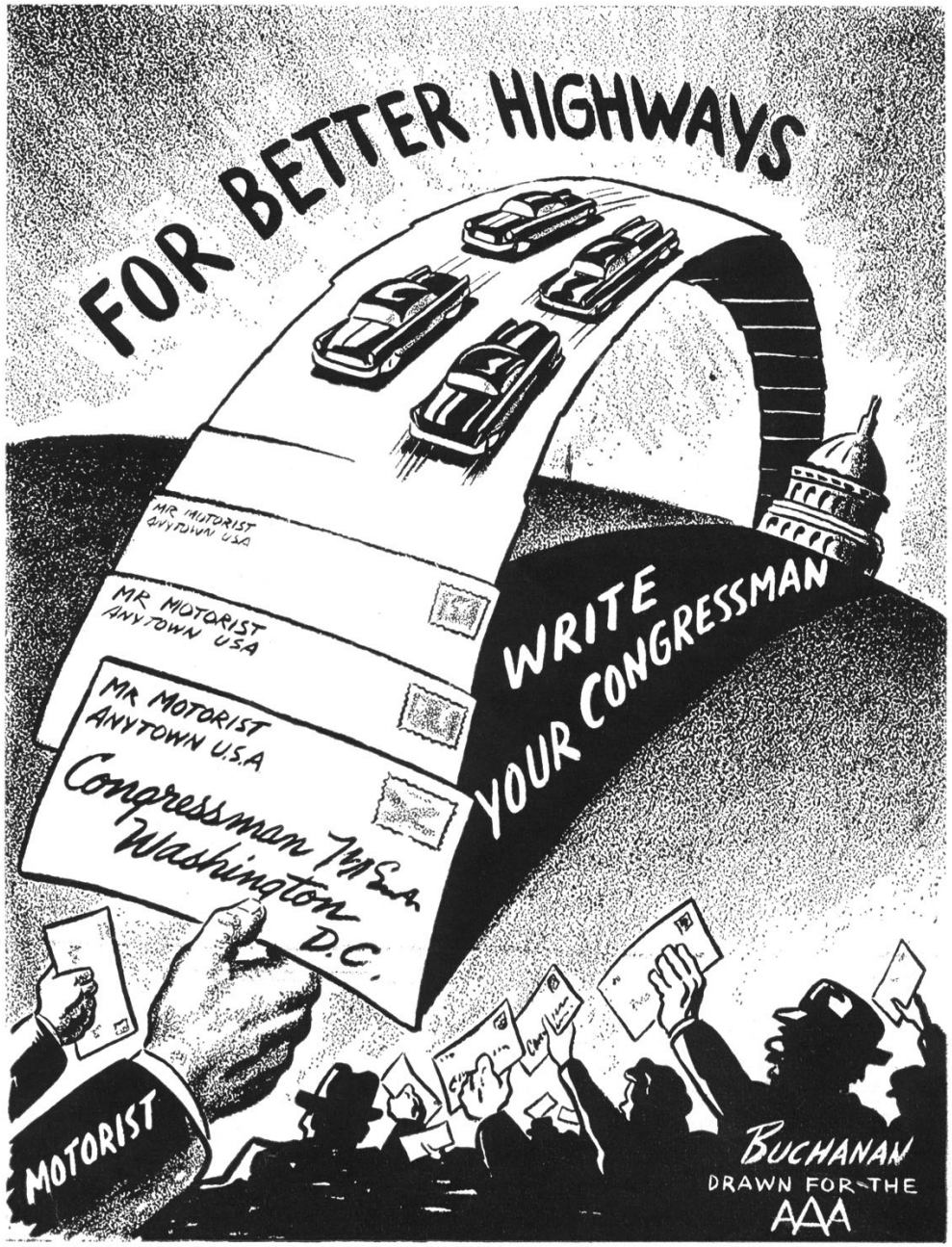
"When this war is over, there will be an immediate necessity of assuring employment for thousands of honorably discharged Army and Navy men. The American Association of State Highway Officials estimates that each billion dollars expended upon highway work will give employment for approximately 750,000 men for a period of one year. In view of these facts, there can be no question but what it is of paramount importance for our Federal government to aid the States in every possible way in the planning and engineering of a large scale nation-wide post-war highway improvement and development program…"

Senator *Carl Hayden* (AZ) – House Committee on Post Offices and Post Roads (1943)

"Winning the peace is not a job we can postpone until the war is won. It is how we work and how we plan while winning the war that will spell victory or defeat in the battle for a worthwhile peace. Each time we have engaged in war it has taken us three or more miserable years to climb back onto our feet. But this is a war that surpasses our wildest nightmares. This time we must meet the peace and remain on our feet, or we may stay down forever...And when I say plans, I mean a fully worked out program, complete with specifications, cost estimates and other preliminary details. I mean plans so complete that the first pinch of war industry layoffs can be relieved without doing injury; so complete that materials can be absorbed as soon as industry can convert to peacetime production. Much of this work must be done by the road builders. Your place in the post-war picture cannot be overemphasized. The House Committee on Roads is now preparing to consider bills designed to meet present and post-war problems. We sincerely hope to have the legislative machinery thoroughly set up, greased and ready to move forward when the present conflict comes to an end…"

***J.W. Robinson*, Chairman - House Committee on Roads (early 1943)**

Support the AAA Motorists' Program!



"Recently the President, by Executive Order, called upon the various departments and agencies to submit their post-war construction plans to the Bureau of the Budget, and to make frequent revisions in order to keep them up to date. The Federal Government has in prospect about seven billion dollars' worth of construction. But very little has been completely planned, with engineering surveys and actual working drawings, and much that has been planned is only partially planned. It has been estimated that of the entire seven-billion-dollar program only about six hundred million dollars' worth of it could be put into operation within the first year after the war..."

General *Philip B. Fleming*, Administrator of the *Federal Works Agency* (December 1943)

"…In the urban highway picture, ripples are now appearing on municipal waters that have long been undisturbed. Some of them have become sizable waves...I have a feeling that those waves will grow larger in the coming months - that whitecaps will appear in municipalities all over America...Municipal officials will come to you asking your cooperation in their traffic problems. I know you will do what must be done...To your past record of erecting the backbone of a highway system which now contains half of all the world's improved roads, you will add a new chapter of helping to unscramble the urban traffic congestion problem. You will respect the city's rights to control its streets, just as the Public Roads Administration has respected the States rights to designate the Federal-aid highway system. But, working hand-in-hand with the Public Roads Administration, you will, as the Public Roads Administration does on a national scale, exercise proper supervision over the local program, to preserve the integrated network of major traffic arteries when the new urban links are welded. The urban job must be done. If you did not cooperate in the doing of it, our cities would find ways of by-passing you, and doing the job some other way. I firmly believe that would bring about grave problems, and that the emphasis on a nationally integrated highway system which you have struggled to maintain would be destroyed."

***J.W. Robinson*, Chairman - House Committee on Roads**

RE: excerpt from his address to the 1943 AASHO annual meeting


MOTORIST
AAA
MOTORISTS' PROGRAM FOR BETTER HIGHWAYS
NATION'S SICK HIGHWAYS
BUCHANAN
DRAWN FOR THE AAA

Part 5

Winning the Peace

Interregional Highway System

"On April 14, 1941, I appointed a committee, known as the National Interregional Highway Committee to investigate the need for a limited system of national highways...to advise the Federal Works Administrator as to the desirable character of such improvement, and the possibility of utilizing some of the manpower and industrial capacity expected to be available at the end of the war…Commissioner of Public Roads Thomas H. MacDonald was authorized and directed to make a survey of the need for a system of express highways throughout the United States...and to report to the President and to Congress, within six months after the date of the Act...The Act was approved on July 13, 1943…Early actions by the Congress in authorizing joint designation by the Federal Government and the several State Highway Departments of a national system of interregional highways is desirable, in order to facilitate the acquisition of land, the drawing of detailed project plans, and other preliminary work which must precede actual road construction. These advance steps taken, the program can serve not only to help meet the nation's highway transportation needs, but also as a means of utilizing productively during the post-war readjustment period a substantial share of the manpower and industrial capacity then available. A program of highway construction, will, in addition, encourage and support the many diverse economic activities dependent upon highway transportation. From personal experience, as Governor of a State and as President, I hope that the Congress will make additional studies in regard to the acquisition of land for highways."

POTUS *Franklin Delano Roosevelt*

RE: in January 1944, FDR transmitted the IHC report to *Congress*. His comments were meant to influence upcoming congressional Highway Hearings, scheduled for early 1944. The report recommended a 33,920-mile system (a House bill under consideration at that time already had a 40K mile system in it for discussion purposes). The IHC report recommended that the program begin in cities and work outward from there since the greatest need for traffic relief existed in urban areas.

"…It will be recalled that we recommended to Congress a Federal grant of not less than $1,000,000,000 a year for each of the three years following the end of the war for highway purposes. Congress was unwilling to make such a large appropriation at this time and we have to be content for the present with half that amount. Even so, at the reduced level the program should become permanent and not merely for a three-year period...Strong opposition in Congress exists to the use of Federal funds for the acquisition of rights-of-way and this seems to us to be unfortunate. We should continue our efforts to convince the members of Congress that such use of Federal grants is not only legitimate but is necessary if we are to make the type of urban improvements which are long overdue and which are so urgently required..."

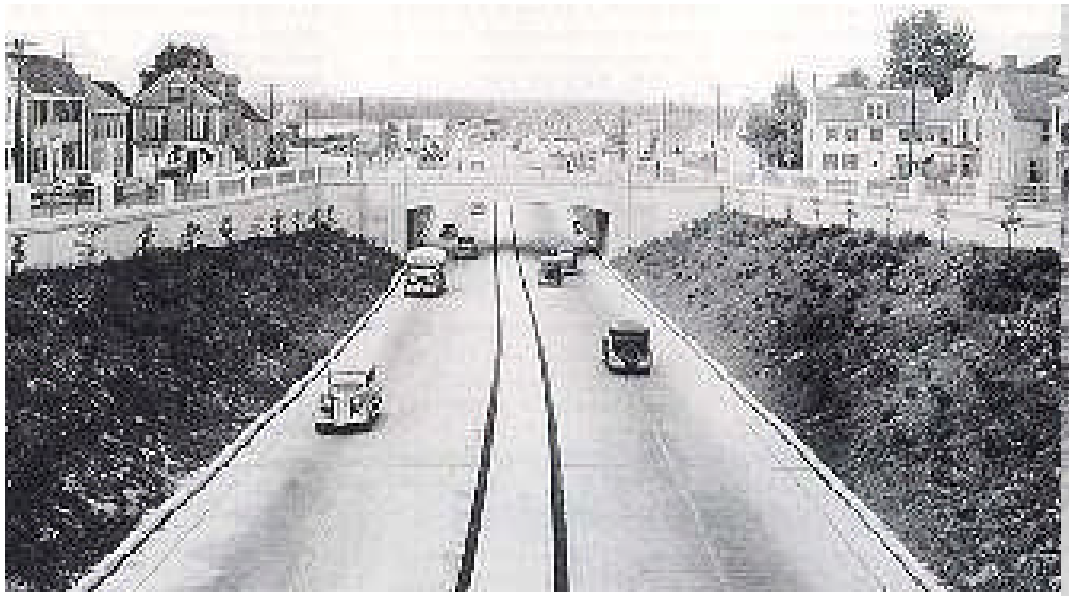
***S.C. Hadden*, AASHO President (1944)**

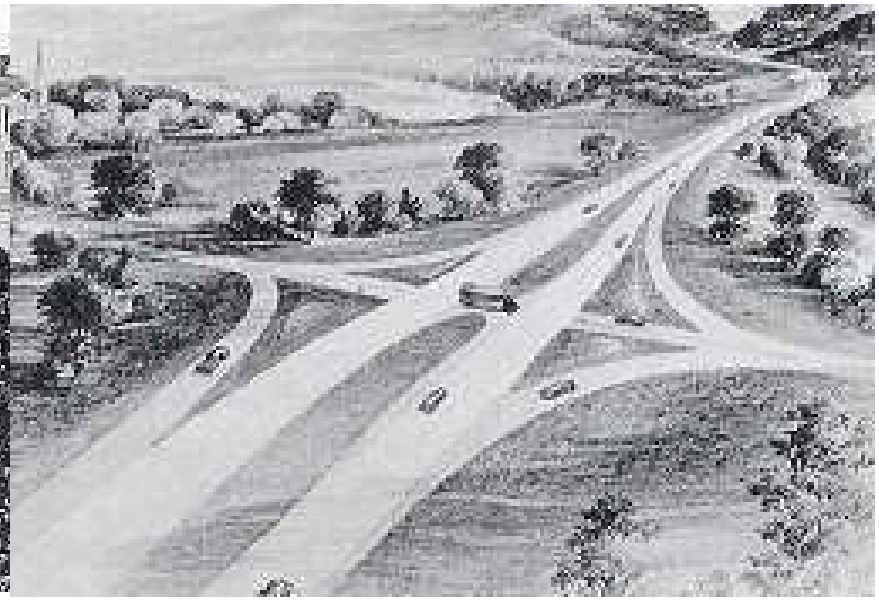
RE: the original AASHO proposal (1943) called for $1 billion per year for three years on a $2 (Federal) for $1 (State) basis to take effect after the war ended. However, there was a new element to be considered; the "Interregional Highway System" recommended by FDR. He noted that there was not unanimity among the states on that system and renewed AASHO's long-standing request for the Federal Government to abandon highway user-taxes in favor of the states. AASHO felt that the fuel tax, levied in the depression years as a temporary emergency measure to provide employment, should either be abandoned or the Federal Government should expand the highway program such that all highway user revenues would be returned to the states. Furthermore, Hadden said that AASHO wanted only one Federal-aid system and one Federal-aid fund, as in the past. Some states wanted the new kind of highways represented by the Interregional System and others felt that they had no need for them and therefore ought to be able to choose. He said that despite provision of special funding and urgings from *Congress* and BPR, the states could not prepare post-war plans until the *Congress* committed itself as to the size of the program and BPR issued its regulations. Otherwise, they had no way of knowing what to plan and design for.

Highway Act of 1944

"...National System of Interstate Highways so located as to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers, to serve the national defense, and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico."

RE: excerpt from *Section 7* of the *Federal-Aid Highway Act of 1944*. A BPR report issued on January 14th 1943 recommended an *Interregional Highway System* of 63,000 km (39,146.5 miles) designed to accommodate traffic twenty years from the date of construction. The report went into detail on urban freeways believing that they would exert a powerful force on the shape of the future city. Thus, It was important for the network to be located to: "promote a desirable urban development." As consideration of the Federal-Aid Highway Act of 1944 began, rival apportionment formulas divided the states. Urban interests battled rural interests for priority and states sought increased authority from the Federal Government. The result of these partisan disagreements was an inability to agree on the major changes needed in the post-war era to address highway needs. The Act primarily maintained the status quo. Although Section 7 authorized the Interstate System, it included no special provisions to give the Interstate Highways a priority based on their national importance neither did it authorize special funding, increase the federal share or make a federal commitment to construct the system.





A total of 110 witnesses and 3,100 typewritten pages of testimony were produced during the 1944 Congressional Highway Hearings out of which came the passage of the 1944 Highway Act. A new era had begun, despite the fact that the AASHO did not get the $1 billion per year that they asked for (they got half that amount). The Act provided that no funds could be paid out until a formal declaration of the end of the war emergency was made, but apportionment took place immediately and obligation to projects could begin. For the first time, funds were earmarked by specific program: The Federal-aid highway system (a.k.a. "primary"); Federal-aid highway system in urban areas (a.k.a. "urban extensions of the primary system"); secondary and feeder roads. The Act provided no Interstate funding and simply authorized designation of the most important routes on the existing Federal-aid system which had, since 1925, been called "Interstate" (when the U.S. numbering system was established). The Act specified that *Interstate* was to be a part of the regular Federal-aid or primary system.

Left: caption: "Early freeway in Newton, Mass., circa 1935, showing access control."

Right: caption: "Artist's conception of an Interstate Highway with at-grade crossings on a four-lane highway designed in conformity with the standards approved in 1945."

"The Federal-Aid Highway Act of 1944 authorizes the designation of a National System of Interstate Highways not exceeding 40,000 miles in extent. No special fund has been provided for use solely on this system but both the funds for the Federal-aid system and those for urban highways may be used in its improvement. Because of variation in conditions among the States no attempt was made to specify what portion of available funds should be applied to the Interstate System. These will be the most important roads of the nation and should be improved to the high standards justified by large traffic volumes. Any considerable lack of uniformity among States in service to traffic would be a serious defect in the system. The standards for the Interstate System adopted by your Association are indicative that you fully realize the need for a uniformly high degree of improvement, and afford the best assurance that it is safe to leave this matter in your hands. However, should one or two States fail to keep abreast of the others in this important matter it might be necessary to consider introducing corrective measures in the law. Full benefit from the National System of Interstate Highways will be realized only when it is completed in all of its parts...Sharing of the cost on a generally 50-50 basis is the teaching of our past experience in building the Federal-aid system. I have seen no indication that equal sharing of the cost will not be equally satisfactory. Should it become necessary to increase the ratio action can be taken when that event proves the need. In any case, I anticipate no eventuality that will suggest a complete Federal assumption of responsibility for the cost of construction..."

***J.W. Robinson*, Chairman - House Committee on Roads**
RE: excerpts from his address to the annual meeting of AASHO (early 1946)

US ARMY
CORPS OF ENGINEERS

"…It is becoming increasingly evident that in carrying out the vast post-war program there are certain difficulties which will be encountered - the high cost of construction, the reluctance of contractors to bid large projects because of the uncertainties of labor and material costs, and the attempt being made to subject the highway construction program to control by some authority that could automatically stop highway construction or start it up depending on the unemployment situation. As President I have taken the liberty on behalf of the Association to write to the Secretary of War and Secretary of the Navy appealing for the prompt discharge of engineers from the military and naval services of our country so that we may not be hampered by lack of trained personnel in our construction program…"

***H.A. MacDonald*, AASHO President**

RE: excerpts from his address to the annual meeting of AASHO (early 1946)[308]

<u>Above</u>: caption: “Seabees’ - those men whose job is to build and fight with the Navy - put together a roadway on the sand dunes of the Virginia coast where they are getting bases”[309]

<u>Above</u>: caption: "On Nov. 20, 1942, after the army engineers and civilian contractors worked on the construction of the Alaska Highway for seven months and 17 days, a crude but motorable road stretching 2,300 kilometers from Dawson Creek, British Columbia, to Big Delta, Alaska, was opened to truck traffic. The road was originally intended to connect and supply a chain of strategic military airfields and to provide an all-weather overland supply route to Alaska during World War II."

"The 1944 Federal Highway Act determined as a matter of national policy that the United States is not going to embark upon any elaborate and extravagant super-highway program. The members of this Association are familiar with the various proposals brought forward during the decade prior to World War II in spanning the continent in colossal gridiron pattern with ribbons of concrete. The Transcontinental highway idea found strong advocates...Congress rejected this proposal. However, Congress was fully aware of the need of an integrated nationwide system of modern highways. The 1944 Act provides that kind of a network…The national policy has been set. We are embarked now on a program under which the Federal Government and the States, working jointly, will develop a national system of interstate highways. The need for this system is urgent. We should therefore forget about transcontinental super highways and concentrate our attention, energies and available funds upon the program established by law."

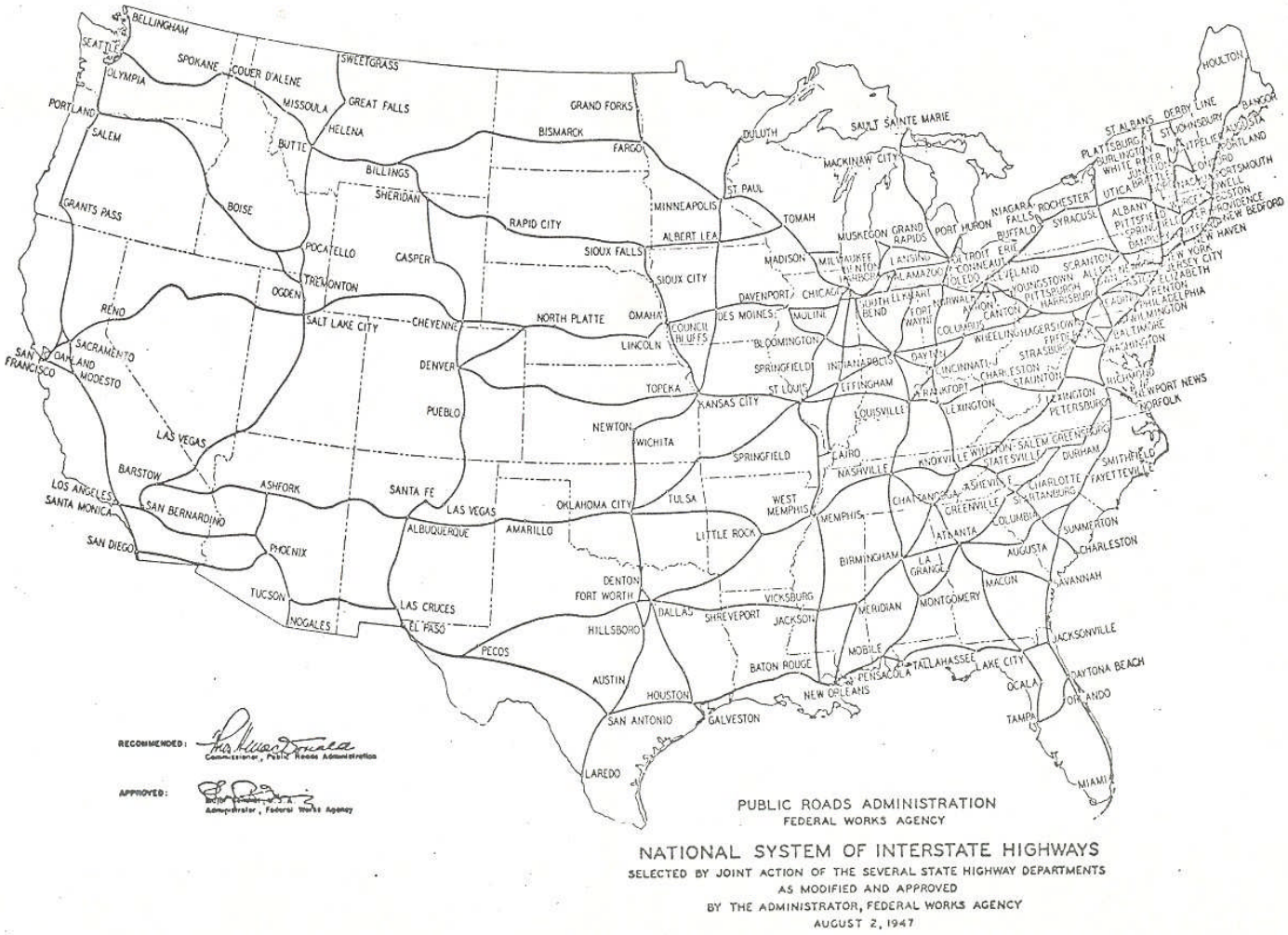
***J.W. Robinson*, Chairman - House Committee on Roads**

RE: excerpts from his address to the annual meeting of AASHO (late 1946)

"The opposition that has developed in several cities to the construction of expressways and other boldly planned highway improvements is not surprising. It seems that history is to repeat itself about express highways for our cities. A number of our cities are debating an important question: 'Shall we build highways which will enable traffic to move into and through the city quickly and safely, or shall we try to get along with things as they are?...' One of the most important purposes of the current highway program is to unsnarl urban traffic tangles as quickly as possible by providing facilities commensurate with traffic requirements. This purpose will be defeated if city officials and other local authorities spend years in debating whether the need for an expressway through the city warrants the cost, or whether this thoroughfare or that thoroughfare should be developed as a controlled access highway. Objections raised by opponents of expressway plans are based upon the contention that (1) the width of the right-of-way required for an expressway necessitates razing a large number of dwellings at a time when the city is in the throes of an acute housing shortage. (2) depressed sections of the expressway would be 'big ditches' which in effect, would disrupt the customary activities of the community by creating a barrier between neighborhoods, and (3) it would be less costly to widen streets which, if moderately improved, would serve present traffic needs. The loudest objection is that express highways cost too much..."

***T.H. MacDonald,* BPR Commissioner (1947)**

<u>Above</u>: caption: "Illustration of peak traffic volumes based on statewide planning surveys of the 1930s"



<u>Above</u>: caption: "Proposed National System of Interstate Highways, August 2, 1947"

"...There has been criticism or at least disappointment, expressed at the rate at which the postwar highway program has been advancing. It is true that funds have not been expended at the rate they have been made available, but nevertheless a very substantial program is under way. There is considerable evidence that work has been offered somewhat in excess of the rate at which the construction industry can absorb new projects...Steel has been the most difficult material to obtain; deliveries have been slow and uncertain...Poor management - failure to start the work on time, and failure to push the work - is reported as the direct cause or contributing cause for unsatisfactory progress on 31 per cent of the projects which are behind schedule...the real reason for unsatisfactory progress is that the individual contractor has been awarded more work than his organization can handle simultaneously...Powered equipment and the rate at which its use is expended on highway work has become the most important factor in production…we cannot increase the rate of highway construction very much faster than the equipment industry increases the rate at which it supplies its highway-contractor customers with replacements and repair parts..."

***T.H. MacDonald,* BPR Commissioner (January 1948)**

<u>Above</u>: caption: "General Philip B. Fleming, Administrator of the Federal Works Agency, home of the Public Roads Administration (PRA), views PRA exhibit at the 1948 convention of the American Road Builders Association in Chicago."

"Against these service requirements and indicated potentials must be measured the progress in highway improvement. Taken by itself the Federal-aid operations of the latest fiscal year are encouraging, but relative to needs the whole program of construction and maintenance is inadequate and unbalanced. During the four years since the end of the war, there has been completed and opened to traffic a total of nearly 50,000 miles of Federal-aid highways. Another 19,000 miles are programmed for construction. These figures constitute an enviable record, particularly in view of the many difficulties that have confronted the highway construction industry in this postwar period…The urban program has not kept pace with the primary and secondary programs. Projects completed to date account for less than the first postwar fiscal year apportionment of urban funds. Although 80 per cent of the urban funds apportioned for the fiscal years 1946, 1947, 1948, 1949 and 1950 have been programmed, less than 60 percent have been covered by approved plans. Interstate system improvements...accounted for about 30 per cent of the total amounts (of urban and primary). About 23 per cent of the primary funds and nearly 46 per cent of the urban funds are for interstate system improvements...The rate at which interstate system improvements have been programmed during the postwar period thus amounts to about 1,000 miles annually…"

***T.H. MacDonald,* BPR Commissioner (1949)**

"…As we entered the 1949 construction season the situation had changed greatly. Materials and equipment were in general readily available in adequate quantities although spot shortages of steel and cement are still being reported occasionally. The labor supply was much improved in both quality and quantity. Workmen more experienced, more energetic and more dependable could be obtained. Instead of being troubled with a shortage of labor we are now being asked to expedite highway construction work in certain areas where unemployment threatens to become a serious problem. As a consequence of these improved conditions bid prices decreased steadily during the first six months of this year...An important deterrent to progress this year has undoubtedly been the inability of some of the States to provide matching funds for the available Federal funds...Because of the cessation in highway construction during the war years and the increase in both volume and weight of traffic since then, the Federal-aid highway system has been wearing out or becoming obsolete at a much faster rate than reconstruction has been performed and permanent improvements made. This resulted in extremely heavy maintenance costs and has necessitated recourse to low type reconstruction and improvements as temporary expedients to keep traffic moving. As Federal funds cannot be used for maintenance, the abnormally large expenditures have caused further disparity between the Federal-aid funds available and the State matching funds available for new construction and reconstruction on fully adequate standards..."

***T.H. MacDonald,* BPR Commissioner (1949)**

A New Policy

"The American Association of State Highway Officials, in a special meeting in Chicago, Ill. on November 21, adopted an important and far-reaching statement of national policy on new Federal-aid for highways...After long and earnest discussion, the Association adopted a statement of national policy on the matter and therein advocated an annual program approximating $810,000,000 per year in Federal funds. The new recommendation for the first time, would make provision for work on the Interstate System of Highways, as such; setting up a special category in the amount of $210,000,000 per year Federal funds, to be matched on a 75-25 basis by state funds. This contrasts with the 50-50 matching on the primary, secondary and urban programs. The Interstate funds would also be available on a new formula of population..."

RE: in October 1949, *D.C. Greer* - President of AASHO, announced a new policy which - for the first time - advocated a separate funding category for the Interstate System by which no state was to receive less than three-quarters of one percent. At the same meeting, there was some resentment exhibited concerning the large expenditures the Federal Government was making to repair war damage in *Europe* while allowing the highway system at home to deteriorate.

"...major development of our highway system is required to overcome obsolescence and to handle safely and efficiently the steadily increasing traffic loads. This is primarily the responsibility of States, counties and municipalities. The Federal Government must, however, continue providing financial assistance to the extent necessary to assure a basic system of national roads, built to uniformly adequate standards...Increased emphasis should be placed upon the Interstate Highway System, a limited network of routes which is of greatest national importance to peacetime traffic needs as well as to our national defense."

POTUS *Harry S. Truman,* 1950

RE: by early 1950, the highway program was finally making real progress. BPR Commissioner MacDonald reported to highway officials and a contractors association that there were no shortages of material, construction prices were falling and construction was proceeding at a record rate. In fact, the Federal-aid program was the largest in history in 1949. He also introduced a proposal to realign the Federal-aid process into two phases. First; surveys, plans, cost estimates and rights-of-way. Second; actual construction (he felt that this would encourage the development of a back-log "shelf" of plans). With this new system project agreements could be entered into for pre-construction project planning. MacDonald said that needs were growing faster than it was possible to provide facilities and that a $4 billion program was necessary to reverse the rising portion of highway dollars devoted to maintenance. He noted that the greatest highway deficiencies were on the Interstates and that experience proved that highways strategic to defense had to be built in peacetime.

War Once More

"The Federal-aid Highway Bill was the first big authorization measure to come before the Senate after the start of the war in Korea. It thus provided something of a test of willingness to cut domestic, non-defense expenditures - cuts which in part would offset the huge new defense budget requested by the President. The Senate did not measure up to the test. In response to a plea from the President, its Public Works Committee - in charge of the bill - cut out some $240 million to be spent over a two-year period…the bill passed by the Senate yesterday, and which now goes to conference with the House, still calls for spending more money than the Budget Bureau recommended and is still a substantial increase over what is being spent now - although what is being spent now was appropriated when there was no war in sight, no tremendous increase in military expenditures and no big tax increase in prospect. The Senate should have cut the authorizations below peacetime expenditures, if only as an indication to the country of its realization of the very serious fiscal situation that lies ahead. It failed to indicate any such realization..."

RE: after several post-war years of being unable to use the money at the rate authorized, the highway program had finally begun to mobilize and the urban and Interstate programs were beginning to receive significant attention. Indeed, for the first time since WWII had ended in 1945, the highway industry was finally in a position to take on an expanded program. AASHO proposed an expansionary bill which the House went along with but before the Senate could act, the *Korean War* broke out in June 1950. The day following the passage of the amended *Federal-aid Highway Act* by the *U.S. Senate*, the conservative *Washington Star* newspaper published an editorial condemning the Senate action in passing the bill during a national emergency as inappropriate (excerpted above).

"From the very beginning, the highway officials have been faced with a difficult philosophy on the part of certain Federal agencies administering the steel program. That is, that highway modernization and reconstruction is not essential under the present circumstances. Confronted with this philosophy, actual accomplishment in the interest of the highway program has been difficult, if not impossible. Allocations made thus far to actual programs, particularly in the structural steel category, have been far below estimated minimum requirements, and the problem has been doubly complicated by the fact that allocations in all too many instances meant nothing more. Acceptance of highway steel orders for actual delivery have been far below the allocated steel tonnage, which was, in turn, far below the estimated requirement. Thus far, the highway program has managed to struggle along, but the future is indeed a gloomy one. A strong resolution on the subject was adopted by the general session meeting in Omaha in October, 1951. What the developments will be in 1952 it is impossible to predict at this time, but certainly this much should be obvious that our highway plant, the conveyor belt of defense production, is no more capable of meeting these international demands than were our production facilities and, as our production plant has been, and continues to be, expanded, so must our highway plant be expanded. If the highways break down, the other efforts will fail..."

***American Highways,* 1951**

"...there is ample evidence that highways today are only fractionally as adequate for today's traffic demands as they were two decades ago…"

***T.H. MacDonald*, BPR Commissioner**

RE: excerpt from his last speech (before retirement) as BPR Commissioner to the annual meeting of the AASHO in December 1952. Automobile ownership had increased rapidly after the end WWII, the highway problem was magnified by the increased speeds of cars and numbers, sizes and load carrying abilities of trucks which were rendering vast mileages of existing roads obsolete due to narrow widths, steep grades, sharp curvatures and other geometric and physical deficiencies. He noted that the old design standards of the 1920's were carried well past the 1930's because of the emphasis on hand labor and minimum use of materials to stimulate employment. He advocated taking the case of the deteriorating highways to the public in the face of growing highway use both by automobiles and trucks as a means of affecting legislative change and was alarmed at the rate of deterioration of the highways in light of the National emergency presented by the *Korean War*. From experience, he had learned that highway programs do not fare well during wartime. To his frustration, the Korean War was interfering with the fact that the states, at long-last, had the ability to take on bigger and bolder projects, as far as highway building was concerned.

The year 1952 was critical, marking the beginning of more favorable circumstances for the national highway program. A new President was in the *White House* (representing the first change of political party in twenty years), WWII was long over and the *Korean War* was drawing to a close. Starting with the 1920's, the highway program had been through a long, difficult time. Though a lot of money was allocated, the *Great Depression* put a damper on real progress in highway construction. Just when the program was beginning to get back on its feet in the late 1930's, WWII effectively shut it down. After the war, a lack of personnel, materials, contractors, machinery etc. caused it to falter. The highway system was in a state of accelerating decay by 1952. Despite these setbacks, highway departments around the country and the industry itself were in a position to take on a much bigger program. Also, the public was becoming all too aware of the highway crisis as more and more people took to the roads, choosing to abandon the cities for the good life in suburbia (above L&R). Additionally, the attitude of *Congress* was changing in favor of action on the highway problem.

In April and May 1953, hearings which came to be known as "The National Highway Study" were held by the *Subcommittee on Roads, Committee on Public Works, House of Representatives, 83rd Congress*. The subcommittee posed twelve questions requiring all witnesses to respond to each of them. The questions ranged from Federal diversion of highway-user taxes, desirability of a Federal trust fund and whether or not the Federal Government should get out of the highway program altogether and/or phase-out BPR. Ultimately, these hearings set the stage for the need to fund and build the *Interstate Highway System*, with emphasis on the urban portions (more-so than the 1955 congressional hearings which accepted the need for the Interstate Highway System as a given thus spending most of the time studying suitable funding and apportionment schemes). In effect, these hearings caused *Congress* to stop diverting Federal highway-user taxes. Thus, sufficient funds would be available to consider a significantly increased highway program including the *Interstate Highway System* as a special, separate program.


corbis

Part 6

A Grand Plan

The Old Convoy

"The old convoy had started me thinking about good, two-lane highways, but Germany had made me see the wisdom of broader ribbons across the land."

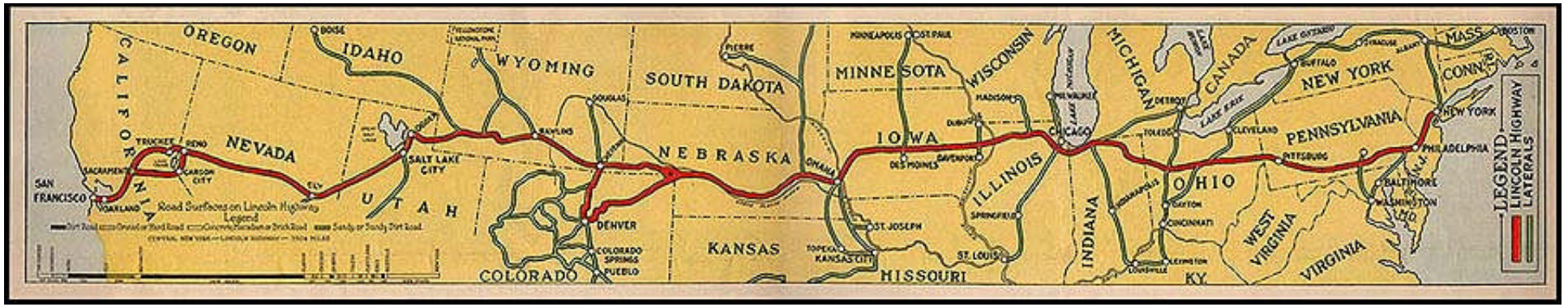
RE: future POTUS Dwight David Eisenhower's first realization of the value of good highways occurred in 1919 when he participated in the U.S. Army's transcontinental motor convoy from *Washington, D.C.* to *San Francisco, CA*. Lt. Col. Eisenhower (left) and a friend heard about the convoy and volunteered to go along as observers. On the way west, the convoy experienced all the misfortunes known to motorists of the era; an endless series of mechanical difficulties, vehicles stuck in mud or sand, trucks and other equipment crashing through wooden bridges, roads as slippery as ice or dusty or the consistency of mud (a.k.a. "gumbo") and extremes of weather. On September 5th 1919, after sixty-two days on the road, the convoy reached San Francisco where it was greeted with medals, a parade and endless speeches. During WWII, General Eisenhower saw the strategic advantages *Germany* enjoyed because of its *Autobahn* network, taking note of the enhanced mobility of the Allied forces as they fought their way into Germany.

"…In observing the effect of the different types of road in progress of the train, it was noted that the trucks operated very efficiently and easily on the smooth, level types, but that on rough roads, sandy ones, or on steep grades the truck train would have practically no value as a cargo carrier. The train operated so slowly in such places, that in certain instances it was noted that portions of the train did not move for two hours. It was further observed that some of the good roads are too narrow. This compels many vehicles to run one side off the pavement in meeting other vehicles, snipping the tire, the edge of the pavement and causing difficulty in again mounting the pavement. This is especially true in a narrow concrete road. It causes fast deterioration of the road. It was further observed that in many places excellent roads were installed some years ago that have since received no attention whatever. Absence of any effort at maintenance has resulted in roads of such rough nature as to be very difficult of negotiating. In such cases it seems evident that a very small amount of money spent at the proper time would have kept the road in good condition…D.D. Eisenhower, Lt. Col., Tank Corps, USA"

RE: excerpt from his formal report on the trans-continental trip (dated November 3rd 1919)

Left: caption: "The whole convoy, Utah"

Right: caption: "At the Firestone Homestead, Columbiana, Ohio / Sunday, July 13, 1919, A Rest Halt / Major Brett, Harvey Firestone, Jr., Colonel Eisenhower"

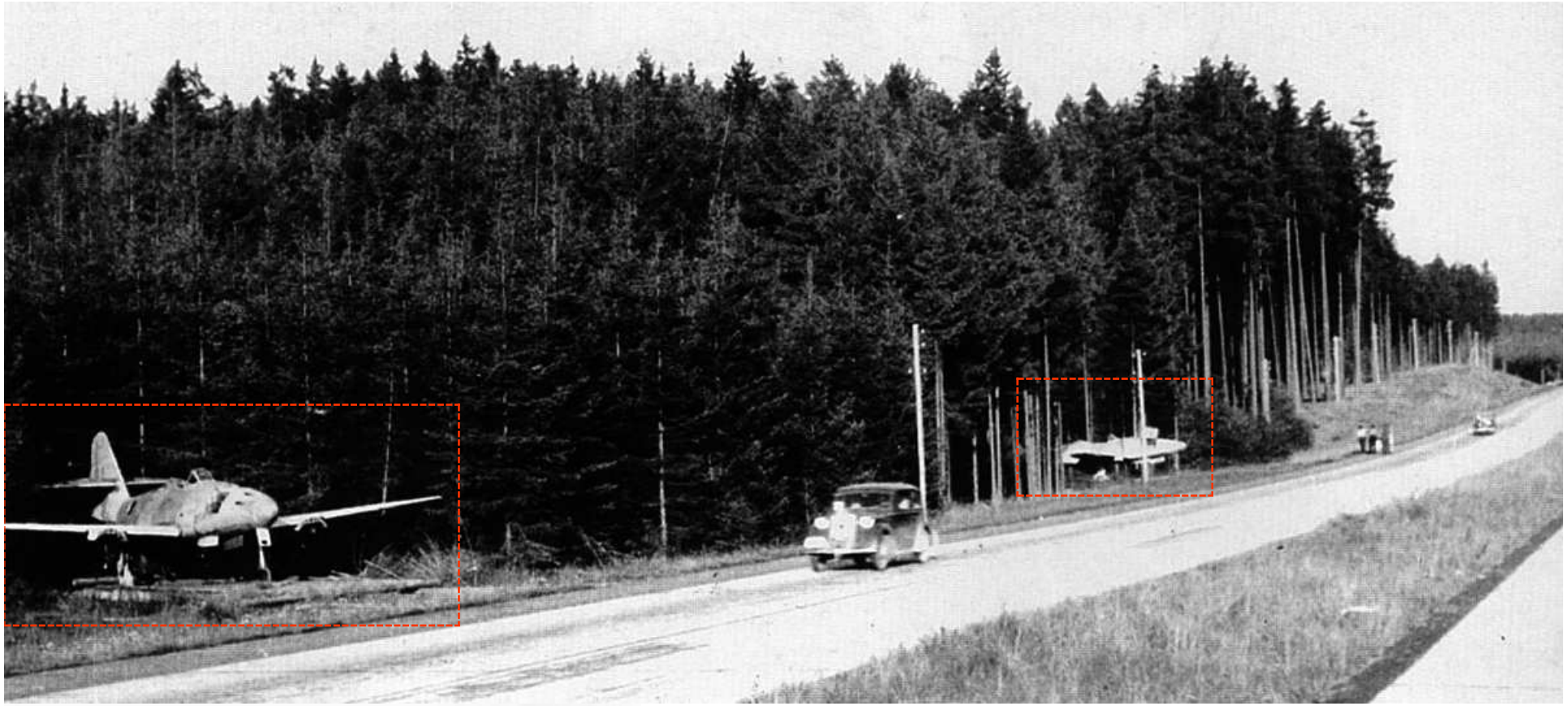


In 1919, the "Transcontinental Motor Convoy," (left) a military expedition, used the *Lincoln Highway* (above) to cross the country from *Washington, D.C.* to *San Francisco, California,* averaging fifty-eight miles per day. It was a test of the U.S. Military's ability to move material and personnel across the country overland using motorized vehicles in the event of war with a potential "Asiatic Enemy" (i.e. *Japan*). They experienced the trials and tribulations inherent with the movement of equipment through unimproved areas, losing several vehicles along the way.

"…Extended trips by trucks through the middle western part of the United States are impracticable until the roads are improved, and then only a light truck should be used on long hauls…"

Lt. Col. *D.D. Eisenhower*, November 1919

<u>Above</u>: caption: "During the 1919 transcontinental convoy, west of Grand Island, Nebraska, soldiers use a winch to pull a Class B truck out of a ditch. Lt. Col. P. V. Kieffer surveys the scene."



<u>Above</u>: two ME-262 jet fighters (highlighted) found alongside the *Autobahn* (near *Munich*)
<u>Left</u>: U.S. army troops pass German POW's on the Autobahn in 1945. As Supreme Commander of Allied forces, Eisenhower marveled at how fast he could move troops and equipment on the Autobahn. It was one of many lessons he would bring with him to the Oval Office.

Call to Action

"The obsolescence of the nation's highways presents an appalling problem of waste, danger and death…as necessary to defense as it is to our national economy and personal safety…"

Dwight D. Eisenhower

RE: comments made to *Hearst Newspapers* as a presidential candidate in 1952

"The obsolescence of the nation's highways presents an appalling problem of waste, death and danger. Next to the manufacture of the most modern implements of war as a guarantee of peace through strength, a network of modern roads is as necessary to defense as it is to our national economy and personal safety. We have fallen far behind in this task - until today there is hardly a city of any size without almost hopeless congestion within its boundaries, and stalled traffic blocking roads leading beyond those boundaries. A solution can and will be found through the joint planning of the Federal, state and local governments. In this, the national government can supply leadership of the kind that is lacking today. It must provide an intelligent leadership to band all units of government in an efficient and honest attempt to build America into the great and prosperous nation it can become. New roads to meet the requirements of today and the foreseeable future, instead of the era when automobiles were a luxury and roads were minor shipping lanes, will be a foundation for the progress ahead. But, the Federal Government must not tackle this problem in the position of a boss, directing the local governments how and when tax dollars can be spent. We have had too much of a Government manned by power-hungry people attempting to tell each community what is good for it and how it should be controlled. An aim of the crusade in which I am engaged is to give to the people themselves the right to develop their nation without dictation by bureaucrats. There were 37,500 men, woman and children killed in traffic accidents last year, and those injured totaled another 1,300,000. This awful total presents a real crisis to America. As a humane nation, we must end this unnecessary toll. Property losses have reached a staggering total, and insurance costs have become a real burden. Added to that is the terrific waste resulting from unnecessary wear and loss of time due to congestion. As has been pointed out by the Hearst Newspapers in tackling the alarming problem, there are now 53,000,000 passenger cars, trucks and buses on our streets and highways. This is an increase of about 23,000,000 vehicles since the end of World War II. We had a traffic jam back in those days. It is not surprising, then, that congestion today is no longer a jam. In and near most industrial areas, traffic amounts practically to a blockade. Throughout the nation, we have state highway departments, county road commissions and municipal street and traffic departments. We have in Washington the Federal Bureau of Roads. By intelligent leadership and wise planning, an integrated program can be devised within the ability of the people to pay the cost. More than at any time in history, modern roads are necessary to defense, and traffic is an interstate problem of concern to the Federal Government. Once a determined and honest effort is made, this crisis, too, will be solved by the ingenuity of America. Any newspaper which undertakes to aid and encourage the progress, prosperity and safety of the future is to be commended for its vision and its public spirit."

RE: statement issued by President-elect Eisenhower to *Hearst Newspapers*

"…But more specifically, our highway net is inadequate locally, and obsolete as a national system. To start to meet this problem at this session of the Congress, we have increased by approximately 500 million dollars the Federal moneys available to the States for road development. This seems like a very substantial sum. But the experts say that 5 billion dollars a year for ten years, in addition to all current, normal expenditures, will pay off in economic growth; and when we have spent 50 billion dollars in the next ten years, we shall only have made a good start on the highways the country will need for a population of 200 million people…A grand plan for a properly articulated system that solves the problems of speedy, safe, transcontinental travel - intercity communication - access highways and farm-to-market movement - metropolitan area congestion - bottlenecks and parking."

***Richard M. Nixon,* VP**

RE: excerpt from his speech made to the Governor's Conference held at *Bolton Landing, NY* on July 12th 1954. President Eisenhower's mother was seriously ill at the time thus, he could not attend the meeting. Instead, he asked VP Nixon to deliver the address from his own notes. Ike asked for a "Grand Plan" for highways extending over a ten-year period and asked the governors for their help. Shortly thereafter, he appointed General *Lucius D. Clay* to head a presidential advisory committee to work with the governors and other groups, hold hearings and to develop highway legislation. The fear of the country lapsing back into economic depression after the *Korean War* was perceived as a real threat. A recession had begun to set in in 1949, but the Korean War served to stimulate the national economy. A strong demand for better highways was at fever pitch and any president would have had to pay attention to that clarion call. From his own experiences traveling cross-country via army trucks after WWI, the impression the *Autobahn* made on him during WWII and BPR Commissioner *Francis V. du Pont* counseling the president that the time was right, the stage was set for real action.

"...Interstate mileage is for all of us - city, county, State and Nation. It is our responsibility as a Nation. We must develop it, find better and more equitable means to finance it, find faster and more efficient methods of acquiring and protecting needed right-of-way and safer and more efficient means of using it when completed..."

POTUS *Dwight D. Eisenhower,* 1954

<u>Above</u>: caption: "President Eisenhower signs the Federal-Aid Highway Act of 1954 on May 6, 1954." By early 1954, Ike was frustrated by the bickering among his advisors about how to finance and construct the Interstate System. In April 1954, he told his staff he wanted an ambitious plan to get $50 billion worth of "self-liquidating highways" (highways that would not add to the national debt) under construction. He chose retired General *Lucius D. Clay* (at far left), a trusted friend, to head the main advisory committee on the Interstate program.

"...And now let us have a look at the Interstate problem. Since the early 20s our efforts have been concentrated on the development of the primary system of highways. During the late 30s and early 40s secondary road aid became a part of the Federal-aid program. About 10 years ago the Interstate system was recognized by Congress, but it had no status. It was merely the designation of a certain portion of the primary system between certain control points. No funds were authorized specifically for this system until 1952 when 25 million dollars was made available. This amount was so small when divided between the 48 States it was not a factor. I have frequently heard it stated before the passing of the 1954 act, that if the Congress would not recognize the importance of this system by making substantial funds available, reference thereto should be eliminated from the Association's future recommendations. In 1954, however, the Congress increased the authorization many fold, namely, to 175 million and changed the matching basis to 60-40 in order to emphasize the importance and stimulate the construction of an Interstate System. Were this not the case, obviously the Congress would have merely increased the authorization for the primary system by a greater amount. Under the 1954 act we are for the first time confronted with converting the old, inadequate primary highway system and bringing it up to most modern standards commensurate with the needs of not only the present, but future traffic…"

***F.V. du Pont*, BPR Commissioner**

RE: excerpt from speech made to the AASHO in 1954

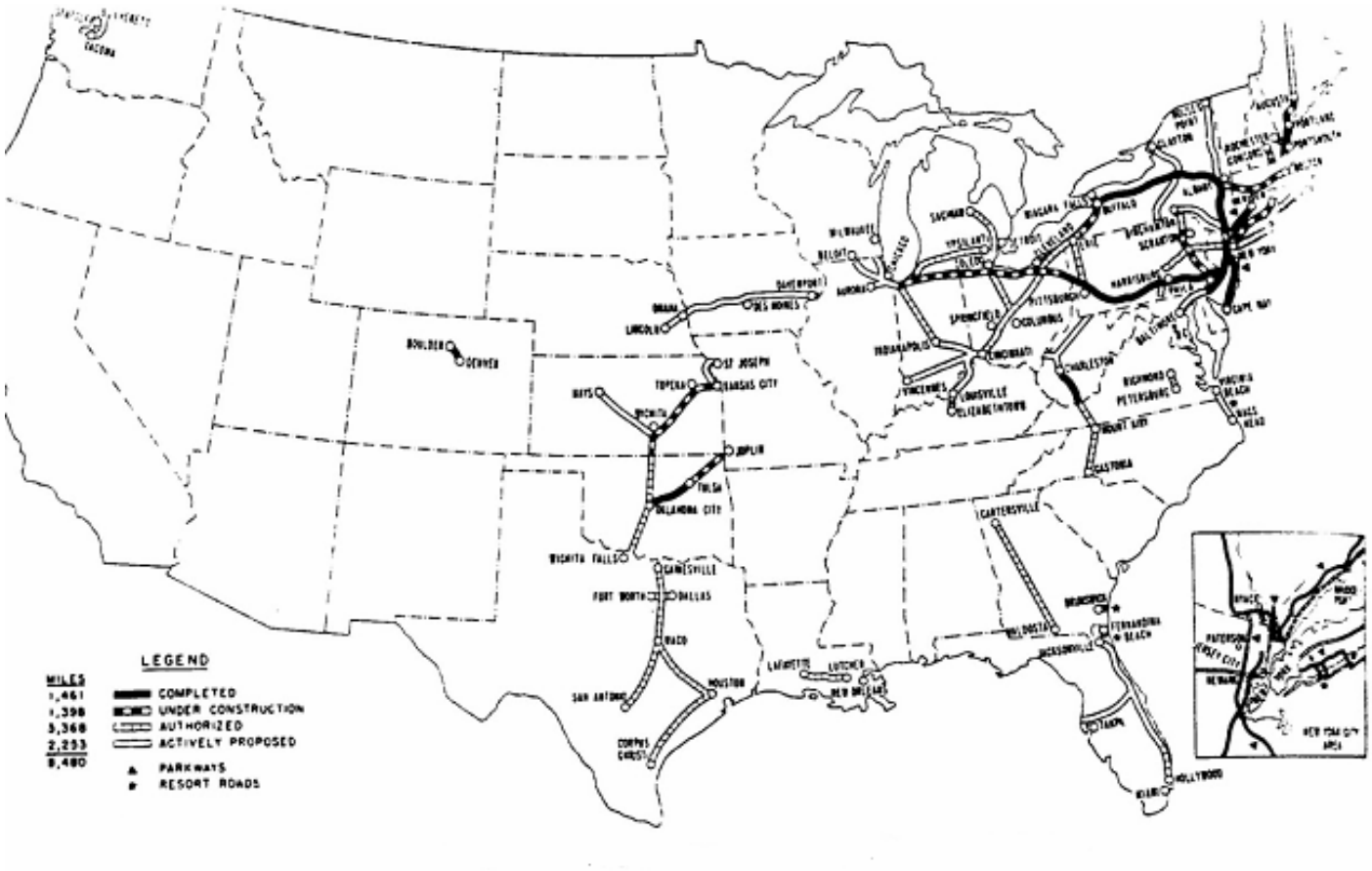
"…varieties of proposals which must be resolved into a national highway pattern…provide a solid foundation for a sound program…Adequate financing there must be, but contention over the method should not be permitted to deny our people these critically needed roads."

POTUS *Dwight D. Eisenhower*

<u>Above</u>: caption: "The Clay Committee presents its report with recommendations concerning the financing of a national interstate highway network to President Eisenhower on Jan. 11. 1955." President Eisenhower forwarded the Clay Committee's report to *Congress* on February 22nd 1955. On May 25th 1955, the *Senate* defeated the Clay Committee's plan by a vote of 60 to 31. The Senate then approved the Gore bill by a voice vote that reflected overwhelming support, despite objections to the absence of a financing plan. By a vote of 221 to 193, the *House* defeated the Clay Committee's plan on July 27th 1955. Because the Senate had approved the Gore bill in 1955, the action remained in the House. Rep. Fallon introduced a revised bill; the "Federal Highway Act of 1956," on January 26th 1956. It provided for a 65K-km (40,389 miles) national system of interstate and defense highways to be built over thirteen years. The Federal share would be 90% or $24.8 billion. Increased funding would be provided for the other Federal-aid highway systems as well.

“A REPORT ON TOLL ROADS
BPR Recommends That They Be Included in Interstate System, With Qualifications, But Receive No Federal-Aid
by NHUC Research Department
Continuation of existing Federal policy against tolls on Federal-aid highways and a change in the law to permit inclusion of toll roads in the Interstate System under certain conditions have been recommended by the Bureau of Public Roads. A toll road report (H. Doc 139) was prepared pursuant to Congressional directive in Section 13 of the Federal Aid Highway Act of 1954 with the aid of information supplied by state highway departments. The BPR recommends that toll roads be included in the Interstate System when they meet the standards and when they are reasonably satisfactory alternate free roads on the Federal-aid primary or secondary systems which permit traffic to bypass the toll road. This recommendation is made, the report states, to meet present-day conditions, since a number of toll roads in operation, under construction or authorized, lie along the preferred location of Interstate routes and duplication of these roads would generally be an economic waste. An additional 6,700 miles on the Interstate System would be feasible for toll financing at an estimated cost of $4,260 million, the report finds. This mileage is in addition to that now adequately improved or scheduled soon to be made adequate, either as toll roads or free roads. The greatest uncertainty affecting feasible mileage of toll financing, the report states, is as to the policies of the states and the Federal government in providing public funds for improvement of the Interstate System. ‘Assurance of public funds to provide reasonably timely completion of the system would soon spell the end of revenue bond financing of roads in the system. Continuation of the present inadequate allocation of funds to this system, however, can only serve to increase the mileage that would be potentially feasible as toll roads.’”

RE: article related to incorporating the then-existing toll roads into the Interstate System, dated May 1955



<u>Above</u>: caption: "Toll roads in operation, under construction, authorized or proposed are indicated on the map above, January 1955"

Missouri’s No. 1 Citizen

"My Dear Senator Symington:

In that you are on the Public Works Subcommittee, I am writing you my views on the improvement and modernization of the highways of the United States. My interest in transportation and communication is as lively as it ever was, so that I have noted with approval the consideration being given the bills pending in the Congress to modernize our major highways within 10 years. I repeat, I have a very great interest in transportation and communication. Every citizen agrees with me that the need to bring our roads and streets up-to-date is urgent. The longer we wait, the greater the cost will be. Every year our outdated and worn-out roads cost us time and money; and, much more important, they cost us lives. Traffic accidents and road congestion together cost us billions of dollars and thousands of lives every year. I have always been interested in traffic safety. In 1946 I called a National Safety Conference to try to find a way to stop death and destruction by highway accidents. Safety conferences were held yearly on the call of the President after the first one. Since returning to Missouri, I have been saddened by the number of people who die, every year, on the highways of this great State. We all know that roads properly built to meet modern highway traffic conditions can help materially to reduce accidents. The saving of life and limb alone would justify the cost of modernizing our road system as quickly as possible. Of course, it will take a big capital outlay to build a modern highway system. Solutions to fiscal problems are never easy, but I am sure we can all see the wisdom of this investment in the future of this great country. It is one that will bring immediate dividends in the convenience, efficiency and, above all, safety to highway travel and transportation. Our improved standard of living and vast economic expansion, which accompanied the tremendous growth of highway transportation over the past 40 years are due in large part to the Federal-aid program first enacted in 1916, under a Democratic administration and subsequently extended and enlarged, always on a public service and not on a partisan basis. The 84th Congress will have few better opportunities to advance the welfare of the American people than by making possible the large scale and rapid development of our highway system. I hope the Congress will take advantage of this opportunity.

With kindest personal regards,

Sincerely yours,

Harry S. Truman"

RE: on March 18th 1955, Senator *Stuart Symington* of *Missouri* submitted this letter from "Missouri's No. 1 Citizen" - former POTUS *Harry S. Truman* (it appeared in the *Congressional Record*)

"…This program is the largest highway program ever conceived in the world, as indeed it has to be to catch up and keep pace with our growing population and expanding economy. The program originated with President Eisenhower's message to the Governors' Conference at Bolton Landing, N.Y., on July 12, 1954. It envisioned a grand plan for a properly articulated system of highways which would solve the problems of speedy, safe, transcontinental travel, intercity communication, access highways and farm-to-market movements as well as metropolitan congestion. Six months later, on January 11, 1955, the Clay Committee report was published. This report became the basis for most of the bills which were considered by the Congress during the ensuing six months. In the meantime, your Association had swung into action. a brief policy statement was drafted at the meeting in Seattle in November, 1954, to serve as a general guide for legislative testimony which our Association officials were certain to be called on to give. This policy statement was developed further in March, 1955, at a meeting of the Chief Administrative Officers held in Chicago…Into the six months between the issuance of the Clay Committee report and the defeat of the road program on July 27, 1955, there were crowded many days of research, deliberation and testimony. The element of haste, considering the magnitude of the program, was very much in evidence. There were sincere differences of opinion within the Congress on how best to finance the program…it is important to remember that when the House of Representatives defeated the road bill, it was not voting down the program; it was voting down the tax feature. As for the program itself, there is no doubt that the need has been thoroughly established. As Commissioner Curtiss said last month, 'the basic elements of the highway problem have come into much sharper focus.' He also expressed confidence 'that this broader, clearer comprehension will lead to early action on a scale far exceeding anything we have known in the past.' The fact is that as a result of all the work that has been done and the testimony that has been spread upon the record, the seeds are in the ground; if we tend them and do not let them wither or rot, they will bring fruit in due season in the form of an expanded highway program…"

***George T. McCoy,* AASHO President**

RE: excerpts from his speech at the annual AASHO convention in December 1955

"…Considering the civil and the national defense, as well as the over-all economic well-being of the nation, the Interstate System of highways should be accorded priority treatment and its completion accomplished within a period of 10 years. A substantial, balanced construction program, however, must not be sacrificed on the other Federal-aid highway systems. The Interstate System should be built to meet the anticipated traffic demands of 20 years hence, and constructed to design standards promulgated and approved by the American Association of State Highway Officials, and with the application of, and the provision for, access control features in accordance with warrants promulgated and approved by the American Association of State Highway Officials. The location and design of the Interstate System should be the joint responsibility of the State Highway Departments and the Bureau of Public Roads. The actual determination of the location of the routes between control points should be based upon engineering studies, traffic analyses, and economic comparisons…"

***America Association of State Highway Officials* (AASHO), March 1955**

RE: excerpt from revised policy statement appearing in the April 1955 issue of *American Highways*

"…In this receptive atmosphere, the House Roads Subcommittee and the Ways and Means Committee, by agreement, separately undertook to develop the program, the one part on the legislation and the financial features as another. Many features of the 1955 bills were adopted, or adapted. A Joint Committee bill was approved by the House on April 27, 1956…The House-Senate Conferees developed a compromise bill by June 25, and on the next day both the Senate and the House approved it by overwhelming votes. On June 29, 1956, the President signed the bill into law."

RE: excerpt from AASHO's Golden Anniversary book published in 1964. On April 27th 1956, the "Federal Highway Act of 1956" passed the House by a vote of 388 to 19. On May 28th and 29th, the Senate debated the Act of 1956 before approving it by a voice vote. The House and Senate versions then went to a House-Senate conference to resolve the differences. The *Federal-Aid Highway Act of 1956* that emerged from the House-Senate conference committee included features of the Gore and Fallon bills, as well as compromises on other provisions from both. On June 26th 1956, the Senate approved the bill by a vote of 89 to 1. Earlier in June, Eisenhower had entered *Walter Reed Army Medical Center* after an attack of *Ileitis*, an intestinal ailment. He was still in the hospital on June 29th 1956 when a stack of bills was brought to him in his sickbed for his signature. One of them was the Federal-Aid Highway Act of 1956. He signed it without ceremony or fanfare in his hospital room.

The *Federal Highway Act of 1956* called for uniform interstate design standards to accommodate traffic forecasts up to 1975. Two lane segments, as well as at-grade intersections, were permitted on lightly traveled segments. However, legislation later passed (in 1966) required all parts of the *Interstate Highway System* to be at least four lanes with no at-grade intersections regardless of traffic volume. Access would be limited to interchanges approved as part of the original design or subsequently approved by the Secretary of Commerce. Service stations and other commercial establishments were prohibited from the Interstate right-of-way (in contrast to the franchise system used on toll roads). Toll roads, bridges and tunnels could be included in the system provided they met system standards and their inclusion promoted development of an integrated system. The interstate system was expanded, but only by 1K miles (to 41K miles). To construct the network, $25 billion was authorized for FY's 1957 through 1969. The legislation also changed the name of the Interstate System to reflect its importance to national defense: "The National System of Interstate and Defense Highways."

"FINAL MILEAGE DESIGNATED

The 41,000-mile Interstate System Is Now Completely Apportioned

New routes totaling 2,102 miles have been made a part of the 41,000 National System of Interstate and Defense Highways, Secretary of Commerce Weeks announced. They include the 1,000-mile expansion of the Interstate System authorized by the Federal-Aid Highway Act of 1956. The remaining 1,102 miles were made possible by estimated savings in mileage resulting from adoption of more direct locations of routes previously designated.

In developing the plan for the routes, Secretary Weeks said, consideration was given to proposals advanced by the various state highway departments for utilization of the 1,000-mile addition to the 40,000-mile Interstate System. He added that the Department of Defense has concurred in the action. Under the 1,000-mile addition authorized by Congress in 1956, four city-to-city routes were approved for designation:

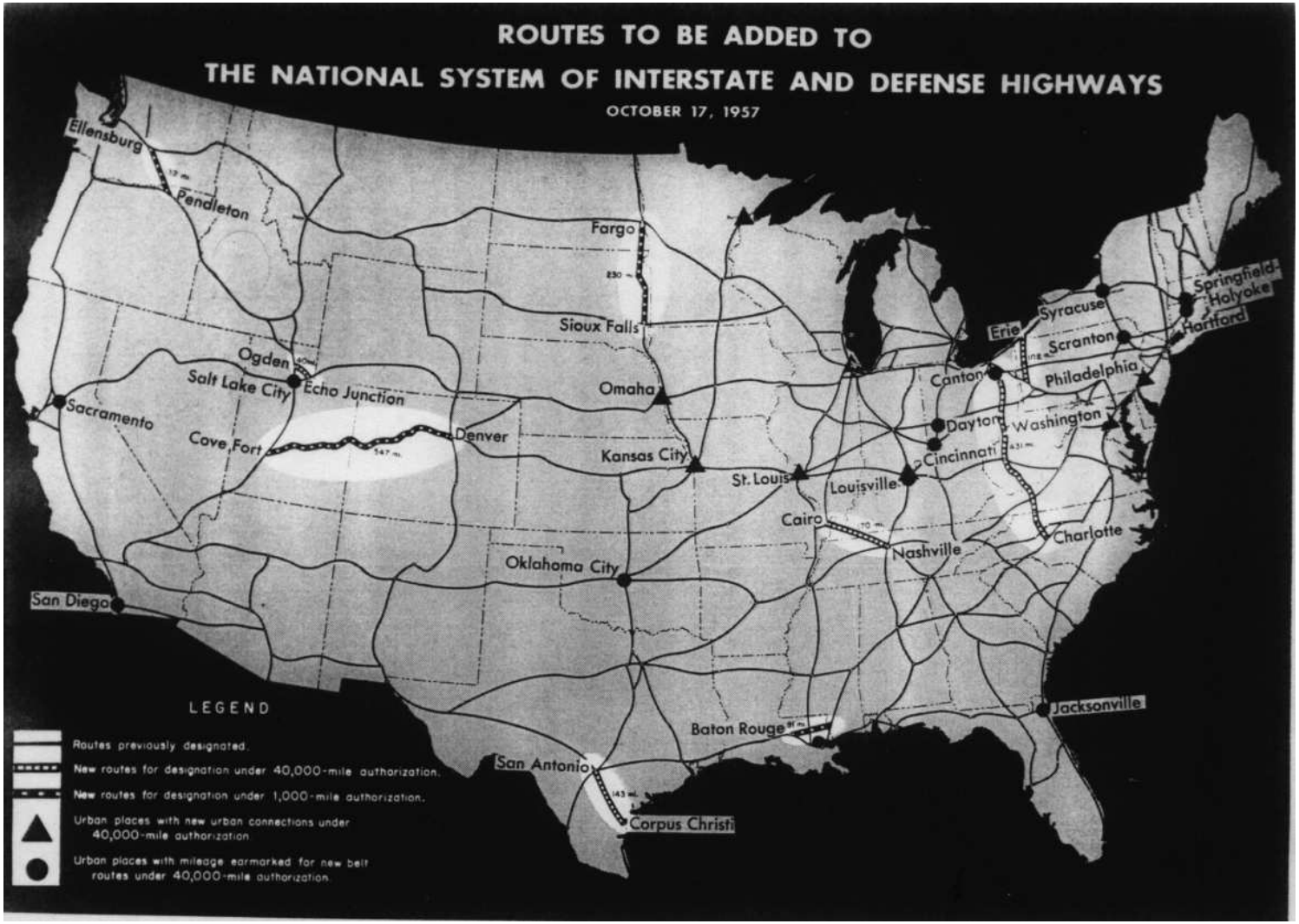
- ***Ellensburg, WA to the vicinity of Pendleton, OR, 132 miles;***
- ***Baton Rouge, LA eastward en-route to Mobile, AL, 91 miles;***
- ***Denver, CO to the vicinity of Cove Fort, UT, 547 miles;***
- ***Fargo, ND to Sioux Falls, SD, 230 miles***

The routes chosen for designation under the original 40,000-mile authorization include five new city-to-city highways totaling 886 miles and 216 miles in or near urban areas. The city-to-city routes including some mileage in intermediate states are:

- ***Canton, OH to Charlotte, NC, 431 miles;***
- ***Pittsburgh, PA to Erie, PA, 102 miles;***
- ***Ogden, UT to Echo Junction, UT, 40 miles;***
- ***Nashville, TN to Cairo, IL, 170 miles;***
- ***San Antonio, TX to Corpus Christi, TX, 143 miles.***

In addition, the 216 miles include: urban connections in Chicago, Philadelphia, St. Louis, Washington DC, Kansas City, Louisville, Omaha, and Duluth (MN), as well as the earmarking of mileage to provide circumferential or belt routes for cities more than 200,000 population where routes already designated fail to provide such facilities."

RE: article related to the additional route mileage designated for the Interstate highway system (dated Oct. 1957)



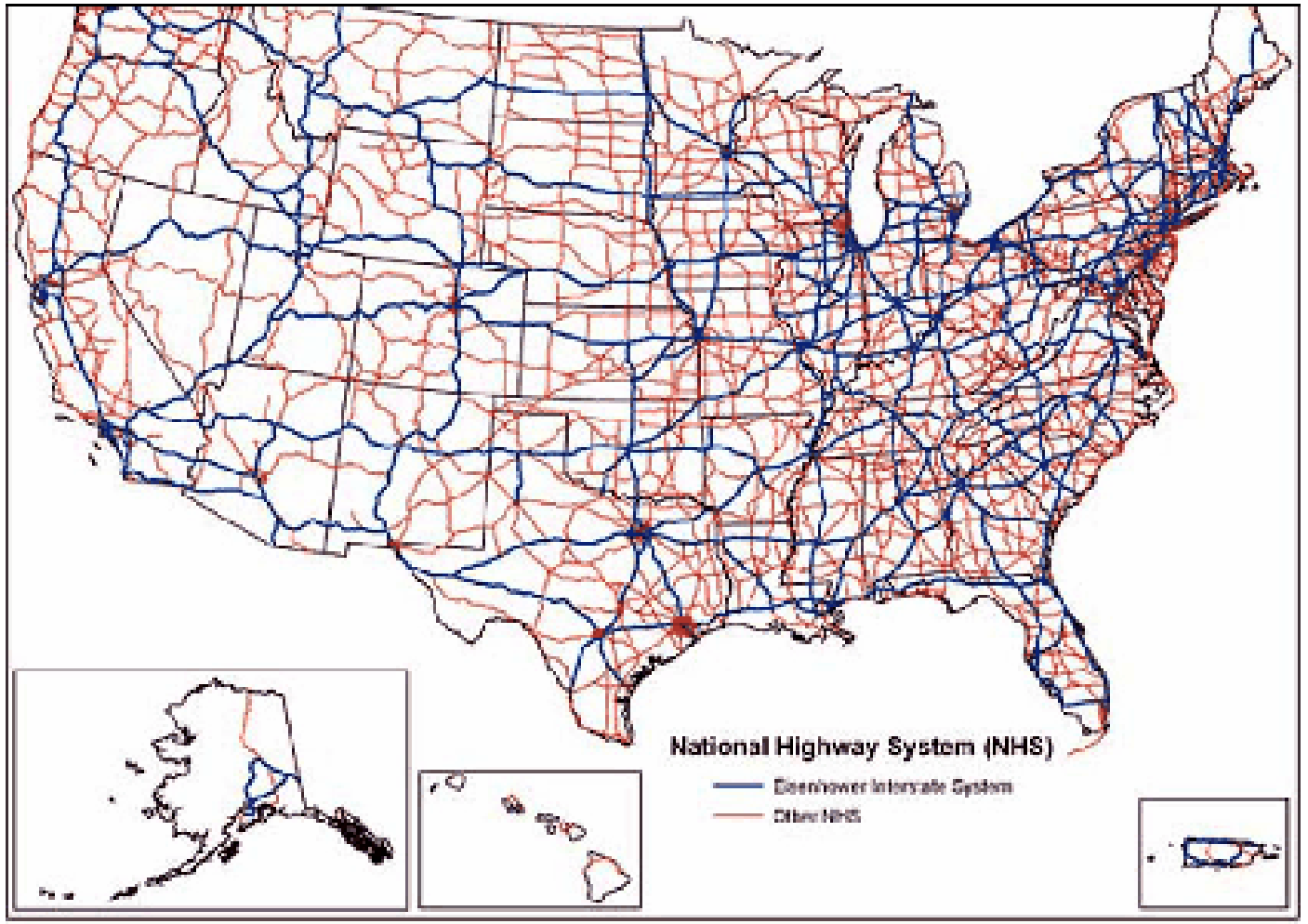
<u>Above</u>: caption: "Additions to the proposed system, October 17, 1957"

"…President Eisenhower, in taking official cognizance of our critical highway problem, has performed an out-standing service to the Nation. He planted the seed in the right place to spark the largest highway construction and modernization the world has ever known. His action will go down in history as one of the most progressive and greatest contributions made by a Chief Executive to the overall welfare of our country…"

***American Highways*, October 1955**

"…More than any single action by the government since the end of the war, this one would change the face of America…Its impact on the American economy - the jobs it would produce in manufacturing and construction, the rural areas it would open up - was beyond calculation…"

RE: excerpt from President Eisenhower's 1963 memoir entitled: "Mandate for Change 1953-1956"



"Together, the united forces of our communication and transportation systems are dynamic elements in the name we bear - United States. Without them, we would be a mere alliance of many separate parts."

POTUS *Dwight David Eisenhower*


EISENHOWER
INTERSTATE
SYSTEM
DEDICATED TO
PRESIDENT DWIGHT D.
EISENHOWER WHOSE
WISDOM AND FORESIGHT
LAUNCHED THE INTERSTATE
HIGHWAY SYSTEM IN
AMERICA." THE GREATEST
TRANSPORTATION MIRACLE
OF ALL TIMES . . ."
WAYNE SHACKELFORD.

Part 7

Building the Broad Highway

A Flying Start

President Eisenhower's choice for the first Federal Highway Administrator was *Bertram D. Tallamy*, who had held several positions with the *New York State Public Works Department* and helped create the *New York State Thruway* (right). Because Tallamy was unable to sever his New York State connections until February 1957, Ike appointed *John A. Volpe* (who had recently resigned as *Massachusetts Commissioner of Public Works* to return to the private sector) to serve as interim Administrator. Like Tallamy, Volpe was a seasoned veteran within the highway community having started his own construction company with initial capital of $300 and built it into a multimillion dollar contracting firm. So it was that on October 22nd 1956, Volpe became the first Federal Highway Administrator (although not confirmed by the Senate). At the *White House* ceremony, President Eisenhower said he wanted to make certain that the highway program got off to a "flying start." He held the Bible while Volpe took the oath of office (left). Volpe coordinated important decisions with Tallamy and in his brief tenure, he reorganized BPR and delegated authority to field offices to handle the increased workload more efficiently. The states, he reported to the President on February 1st, were moving forward aggressively; only five had not obligated any of their FY 1957 Federal funds. In submitting his resignation, Volpe said: *"My 100 days in Washington have been exciting, challenging, busy, action-packed, and, I trust, productive."* On February 5th 1957, U.S. Secretary of Commerce *Sinclair Weeks* administered the oath of office to Bertram Tallamy, who was unanimously confirmed by the Senate.

The first project to begin construction under the *Federal Highway Act of 1956* was the *Mark Twain Expressway* portion of U.S. 40 (future I-70) in *St. Charles County, MO.* Construction of the $1.87 million project, which included 3.1 miles of bridging, grading and concrete paving (leading to a new bridge over the *Missouri River*) began on August 13th 1956. The *Missouri State Highway Commission* placed a sign on the project declaring it to be the first on which actual construction was begun under the 1956 act (above). On August 31st 1956, the *Kansas State Highway Commission* awarded a contract for concrete paving of an 8-mile section of U.S. 40 (I-70) outside *Topeka*. Construction had begun before enactment of the 1956 law but under the new contract, paving began on September 26th with funds provided under the new program. Joined by BPR officials, First District State Highway Commissioner *Ivan Wassberg* marked the historic occasion by scratching "9-26-56" in the fresh concrete. On November 14th 1956, highway officials held a ribbon-cutting ceremony and posted a sign proclaiming the project to be the first completed under the 1956 act (left).

In July 1956, BPR and the AASHO agreed on design standards for the Interstate System. Access would be controlled, with crossroads carried over or under the routes. The system would consist of divided highways with a minimum of two travel lanes in each direction, 12-foot lane widths, 10-foot wide right paved shoulder and 4-foot wide left paved shoulder. In sparsely settled rural areas where traffic volumes were low, the standards would be relaxed, with at-grade crossings permitted in some cases. Two-lane sections with one lane in each direction would be built to one side of the right-of-way so additional lanes could be added when traffic warranted. The highways would be designed for speeds of 50 mph in mountain terrain, 60 mph in rolling terrain and 70 mph in flat terrain. Bridges and overpasses would be built without overhead obstructions, but all structures would allow at least 14-feet of vertical clearance over the roadways and shoulders.

<u>Top Left</u>: caption: "Interstate 94 (Edens Expressway) showing 6 traffic lanes, off ramp right and one ramp left, steel cable guard in median, Chicago, Illinois."

<u>Top Right</u>: caption: "Illinois - A tri-level interchange interconnects Interstate Routes 57 and 70 southwest of Effingham. Each of the three levels carries traffic in one direction only."

<u>Left</u>: caption: "Paving operations near Richardton, ND on Interstate 94."

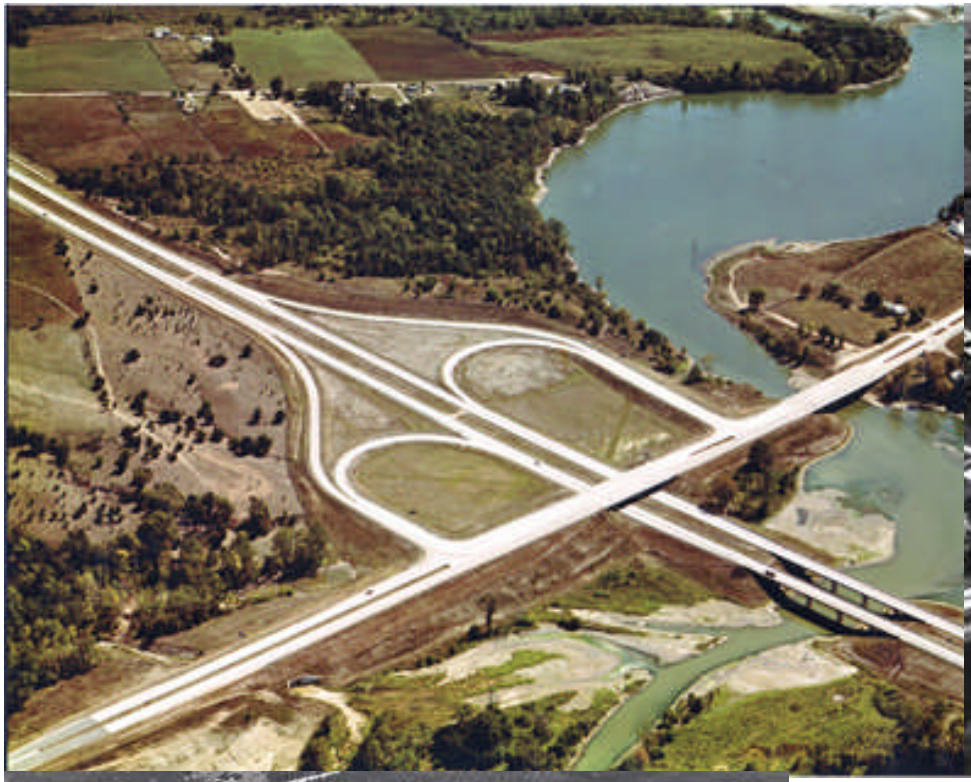
<u>Above</u>: caption: "California - Four-level interchange"

<u>Left</u>: caption: "A four-level interchange at the inter-section of I-20 and I-35 in Fort Worth, Texas, weaves the ramps above and below the roads."

<u>Top Left</u>: caption: "California - Traffic on the Santa Monica Freeway (I-10) near the intersection with the Santa Ana (I-105) and Golden State Freeways (I-5). Note the use of the corrugated plastic shield on the median barrier rail."

<u>Top Right</u>: caption: "California-Ground view of Interstate 5 at Riverside Drive Off-Ramp."

<u>Left</u>: caption: "Interstate 94 (Edens Expressway) View showing 6 traffic lanes, 24 foot median with steel cable guard rail - looking N.W. from Oakton St. Chicago, Illinois.



<u>Top Left</u>: caption: "Indiana - I-70 near Richmond."

<u>Top Right</u>: caption: "Interstate 69, here meeting Indiana State Route 14 at a cloverleaf interstate section, bypasses Fort Wayne (not yet in use when photographed)."

<u>Left</u>: caption: "Santa Ana Freeway, looking northeasterly toward Los Angeles Street interchange (three-quad modified diamond interchange)."

<u>Left</u>: caption: “Looking northwest along the Golden State Freeway showing western Avenue cloverleaf in Glendale (four-quad cloverleaf interchange with collector-distributor roads).
<u>Right</u>: caption: “Colorado - Denver Valley Highway - Interstate Route 25 at the Speer Boulevard cloverleaf interchange. Speer Boulevard is a principal artery to downtown Denver.”

<u>Top Left</u>: caption: "California - Interstate Route 405, the eight-lane San Diego Freeway in Los Angeles County crosses over Sepulveda Boulevard near the massive Mulholland Cut."

<u>Top Right</u>: caption: "California - San Bernardino Freeway looking east on Kelleg Hill showing summit cut."

<u>Left</u>: caption: "Colorado - Big rock job on I-70 at historic Georgetown, near grade. Excavation ran around 1,500,00 cubic yards in 2.6 miles, much of it in solid silver plume granite."

Top Left: caption: "New York – Pre-split rock cut along I-87 in Warren County, This method provides for line of drill holes along the proposed rock backslope which are lightly charged and set off with the regular drill holes using millisecond delays. This provides a relatively smooth face, eliminating much scaling and simplifying future maintenance."

Top Right: caption: "New Jersey portion of largest single grading contract in history of Dept. including 3 1/2 million cubic yards of excavation. Cuts run to 127 feet deep and fills to 107 feet. Looking west from top of south side of jugtown Mt. Notch. Route 78."

Left: caption: "Oregon - One of last major sections of the Interstate system to be completed in Oregon is I-84. Present plans call for the completion of this freeway on schedule. Here work is shown in progress on the South Baker Inter-change."

Above: caption: "Pennsylvania - North Scranton - triple trumpet interchanges link Interstate Route 81, on the right side of the picture, U.S. Routes 6 & 11, at the lower left and the northern terminus of the Northeast Extension of the Pennsylvania Turnpike, which comes in from the left on a high viaduct (paralleling U.S. Routes 6 & 11 in the lower left is a railroad)."

Left: caption: "Oregon - Construction workers pour pavement on the Huntington Bypass Section of I-84 as work on that section of the Interstate system moves steadily toward completion. Oregon has completed 86 percent of its Interstate system to present-day standards (ca. 1968)."

Left: caption: "Montana - I-90, Homestake Pass east of Butte - Continental divide facing west. Rest Area in upper center."
Right: caption: "Inspectors, designers and engineers who worked on the first section of the interstate highway system in Minnesota (I-35 near Owatonna) gather in Rochester in 1958 to celebrate its completion."

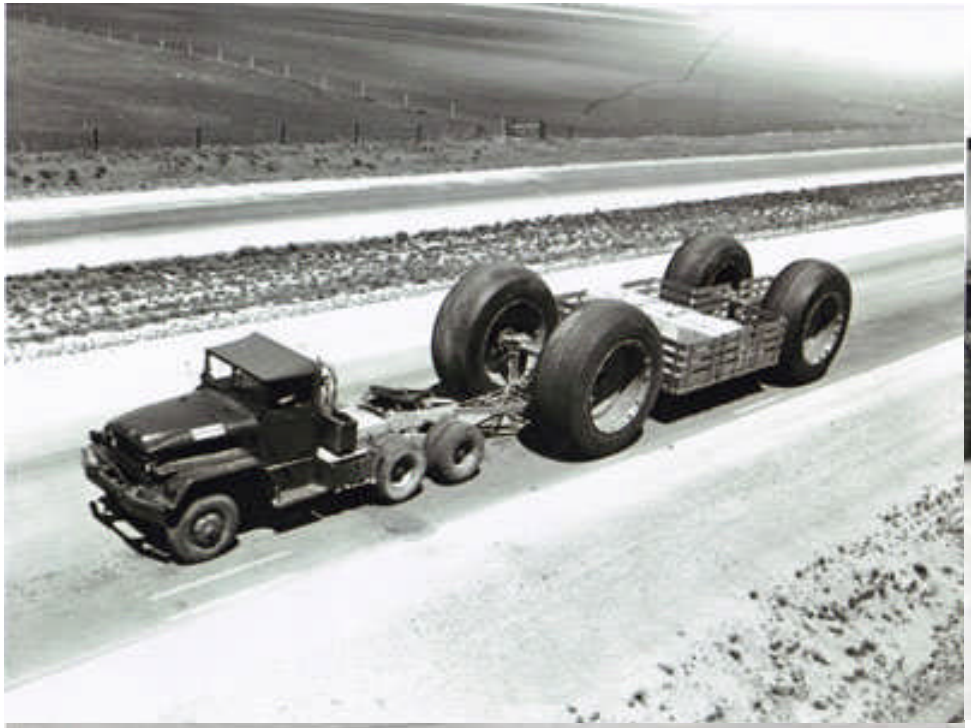
The Highway Research Board

The design of pavements and bridges on the *Interstate Highway System* largely followed the results of road tests conducted by the AASHO. The test site in *Ottawa, IL*, was financed by state highway agencies, *BPR*, the *Department of Defense*, *Automobile Manufacturers Association*, *American Petroleum Institute*, *American Institute of Steel Construction*, foreign countries and U.S. materials and transportation associations. The "Highway Research Board" (HRB) administered the project. In August 1956, workers began constructing seven miles of two-lane pavements in the form of six loops and a tangent (straight), half concrete and half asphalt. The 836 test sections employed a range of surface, base and sub-base thicknesses and included sixteen short-span bridges. Test traffic was inaugurated on October 15th 1958, with the Dept. of Defense providing drivers and heavy vehicles. The road tests ended ob November 30th 1960. The test data established the relationships for pavement structural designs based on expected loadings over the life of a pavement. Although the bridge findings were consistent with predictions, the road test provided the foundation for the analytical evaluation of stresses and deflections from moving vehicles. The AASHO road test is a landmark in highway and bridge design. The straight portion of the track is now part of I-80 in *Illinois*.

<u>Top Left</u>: caption: "After ribbon cutting ceremony, first trucks roll over Loop 6(D) at the AASHO Road Test. (October 15, 1958)."

<u>Top Right</u>: caption: "AASHO Road Test - Illinois - (K-I) HETAG Heavy Duty Tank Transporter used in the special conducted after completion of regular test traffic."

<u>Left</u>: caption: "AASHO Road Test - Illinois - L-3 Heavy Duty Tank Transporter used in the special test conducted after completion of regular test traffic."



<u>Top Left</u>: caption: "AASHO Road Test - Illinois Off-Road Train Trailer used in the special test conducted after completion of regular test traffic."

<u>Top Right</u>: caption: "AASHO Road Test - Illinois - LPLS Tire mounted on Special Test vehicle for Post Test Special Studies."

<u>Left</u>: caption: "AASHO Road Test track, near Ottawa, IL."

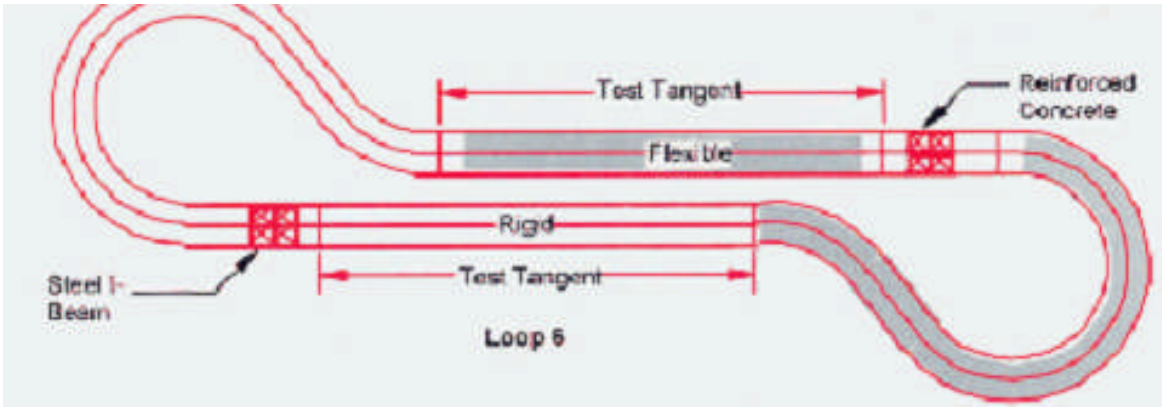
<u>Above L&R</u>: caption: "AASHO Road Test Illinois - Traffic over Test Bridge."

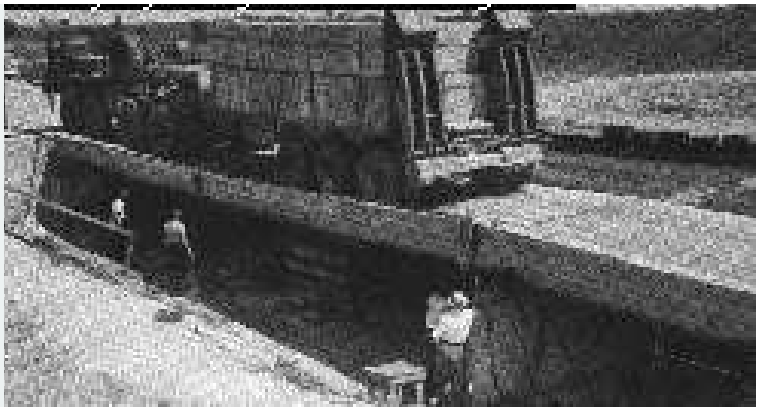
<u>Left</u>: caption: "AASHO Road Test – Illinois - Taking deflection measurements with the Benkelman Beam device."

<u>Top Left</u>: caption: "AASHO Road Test Illinois - Longitudinal Profilometer."

<u>Top Right</u>: caption: "AASHO Road Test - Illinois - Two-axle tractor scraper used in special studies after regular test traffic."

<u>Left</u>: "AASHO Road Test - Illinois - Aerial view of AASHO Road Test."





The importance of the Interstate for military transport was critical. Thus, the *Department of Defense* closely monitored all phases of the testing. During WWI, roads throughout the country were nearly destroyed by the weight of military trucks. During WWII, 13% of the defense plants received all their supplies by truck and almost all other plants shipped more than half of their products by motor vehicle. Also discovered was a bewildering array of standards. Some states allowed trucks up to 36K pounds while others restricted anything over 7K pounds. The AASHO was responsible for all testing including asphalt and Portland cement pavement on all base soil types, construction techniques and other roadway standards. They also tested axle loads and gross vehicle loads on all pavement types and bridges. Special military vehicles and highway construction equipment were also included in the test program. AASHO began with 81 vehicles, increasing as the test program evolved. The average day was 18 hours, including 14 hours driving and 4 hours maintenance and driver changes.

Left: caption: "Test Loop 6 plan"

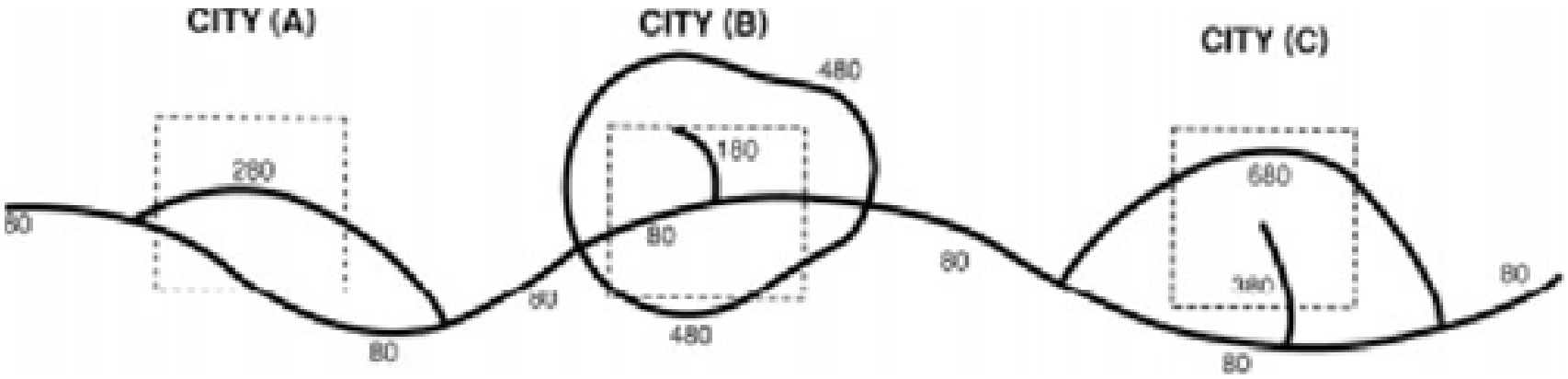
Right: caption: "Vehicle with extra heavy load during a test-to-failure with increasing loads"

"Much of the success of Operation Desert Storm was due to our logistical ability to rapidly move troops to theater. The US highway system supported the mobilization of troops and moved equipment and forces to US embarkation ports – this was KEY to successful deployment."

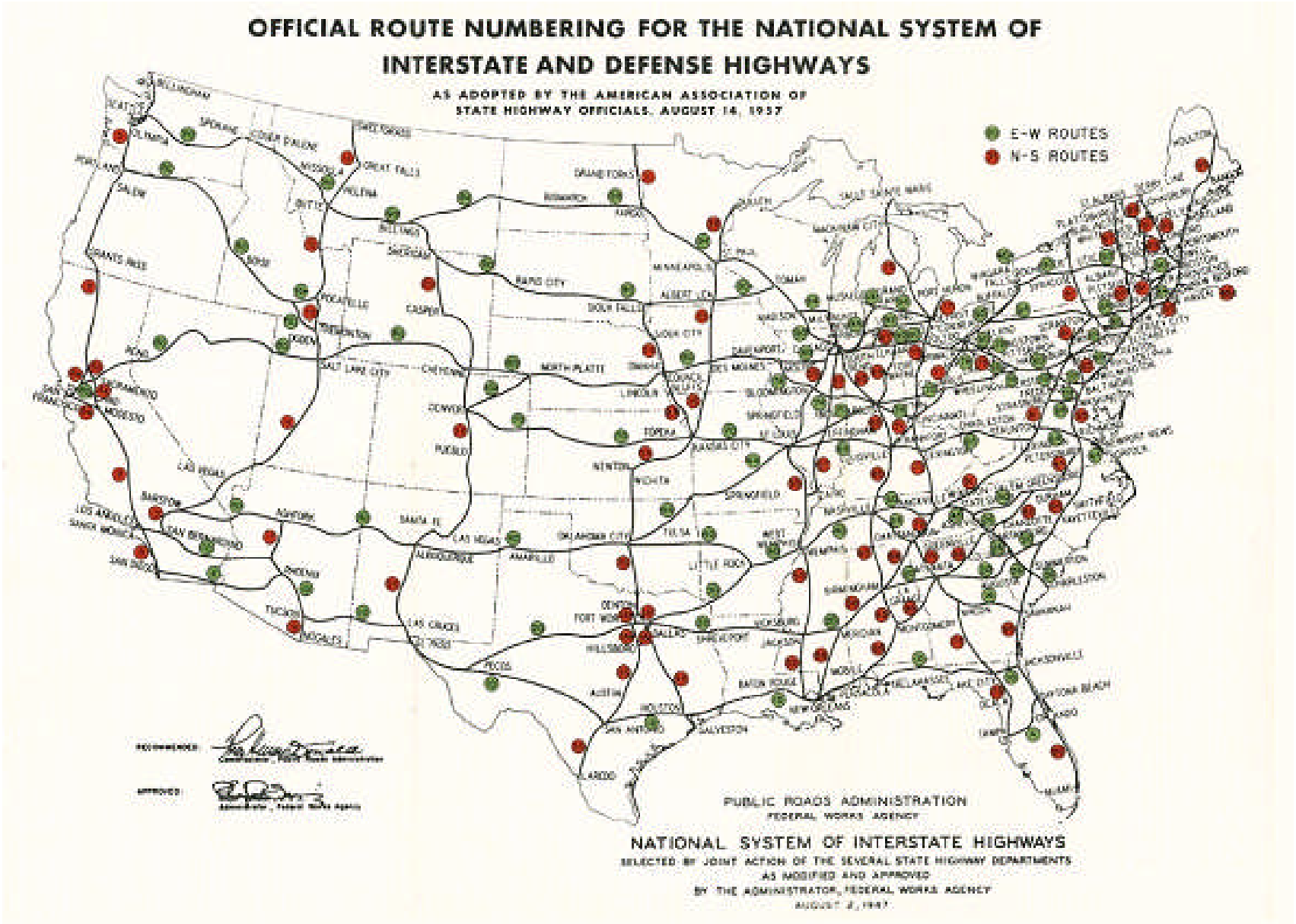
Lt. Gen. *Kenneth Wykle*, Deputy Commander in Chief – U.S. Transportation Command

<u>Left</u>: military convoy on the NJ Tpke.

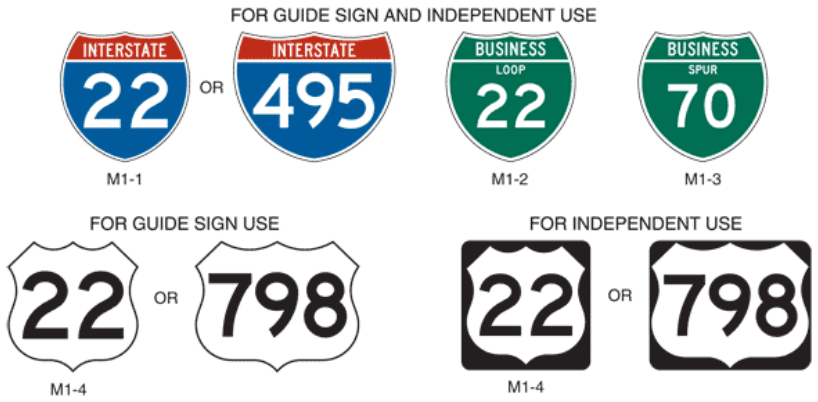
Knowing Where You’re Going



In September 1957, BPR and AASHO applied route numbers to the Interstate highways. They adapted the U.S. numbering plan for the system, but in mirror image. Where the lowest, odd-numbered, north-south U.S. route was on the East Coast (U.S. 1), the lowest, odd-numbered Interstate route would be on the West Coast (I-5). Similarly, the lowest, even-numbered east-west U.S. route ran along the Canadian border (U.S. 2), while the corresponding Interstate route was in the South (I-10). In two cases, a major route has two parallel or diverging branches. In those cases, each branch is given the designation of the main route, followed by a letter indicating a cardinal direction of travel (east, west, etc). In *Texas*, for example, I-35 splits at *Hillsboro*, with I-35E going through *Dallas*, while I-35W goes through *Fort Worth*. The two branches merge at *Denton* to reform I-35. A similar situation exists along I-35 in the *Minneapolis-St. Paul* area of *Minnesota*. The major route numbers generally traverse urban areas on the path of the major traffic stream. Generally, this major traffic stream will be the shortest and most direct line of travel. Connecting Interstate routes and full or partial circumferential beltways around or within urban areas carry a three-digit number. These routes are designated with the number of the main route and an even-numbered prefix. Supplemental radial and spur routes, connecting with the main route at one end, also carry a three-digit number, using the number of the main route with an odd-number prefix. To prevent duplication within a state, a progression of prefixes is used for the three-digit numbers. For example, if I-80 runs through three cities in a state, circumferential routes around these cities would be numbered as I-280, I-480, and I-680. The same system would be used for spur routes into the three cities, with routes being numbered I-180, I-380, and I-580, respectively. This system is not carried across state lines. As a result, several cities in different States along I-80 may each have circumferential beltways numbered as I-280 or spur routes numbered as I-180 (see drawing above).



<u>Above</u>: caption: "Approved route numbering for the Interstate System, dated August 14, 1957"



Above: caption: "Interstate, Off-Interstate, and U.S. Route Signs. This figure shows eight Interstate, off-Interstate, and U.S. route signs. The first set of signs consists of four signs labeled 'FOR GUIDE SIGN AND INDEPENDENT USE':

• M1-1 is shown as a shield with a white border, with the word "INTERSTATE" in white capital letters on a red background in the top portion of the shield, with a horizontal white line underneath from border to border. Under the line, the large white numeral '22' is shown on a blue background. To the right of this sign, the word 'OR' is shown and another sign. This is shown as the same sign but with the numeral '495.' The shield with '495' is wider than the shield with '22.'

• M1-2 is shown as a shield with a green background and white border, with the word 'BUSINESS' in white capital letters in the top portion of the shield, with a horizontal white line underneath from border to border. Under the line, the word 'LOOP' is shown in smaller white capital letters. Under this, the large white numerals '22' are shown.

• M1-3 is shown as a shield with a green background and white border, with the word 'BUSINESS' in white capital letters in the top portion of the shield, with a horizontal white line underneath from border to border. Under the line, the word 'SPUR' is shown in smaller white capital letters. Under this, the large white numerals '70' are shown.

• The second set of signs consists of two signs labeled 'FOR GUIDE SIGN USE.' The signs are shown as white cutout shields with a black numeral surrounded by a black border. The sign on the left (M1-4) shows the numeral '22.' The sign on the right shows a wider shield with the numerals '798.'

• The third set of signs consists of two signs labeled 'FOR INDEPENDENT USE.' M1-4 is shown as a black square with the black numeral '22' on a white shield. The sign to its right is shown as a horizontal rectangular black sign with the black numeral '798' on a wider white shield."


NORTH
24
35
Des Moines
EXIT 2V
14th St
Downtown
EXIT 2U
WEST
670
70
Topeka
EXIT 2U
70
EAST
St Louis
EXIT 2U
Broadway
EXIT ONLY
TO
25
87
EAST
20
26
TO
25
87
WYOMING
220
BUSINESS
20
26
EXITS 52 A - B
EXIT 53
WEST
24
TO
70
Nashville
Knoxville
440
WEST
Memphis
1/4 MILE
US
66

In the contiguous 48 states and the *District of Columbia*, 62 main one or two-digit numbered routes were assigned. Of these, 27 are in a primarily east-west alignment and therefore carry an even number. Another 35 routes are odd-numbered because of their primarily north-south alignment. Although 261 auxiliary circumferential, spur and radial routes are designated, only 151 three-digit numbers have been assigned. This is because three-digit numbers can be used in more than one State.

The five longest Interstate routes, each more than 2K miles, are east-west routes. These are:

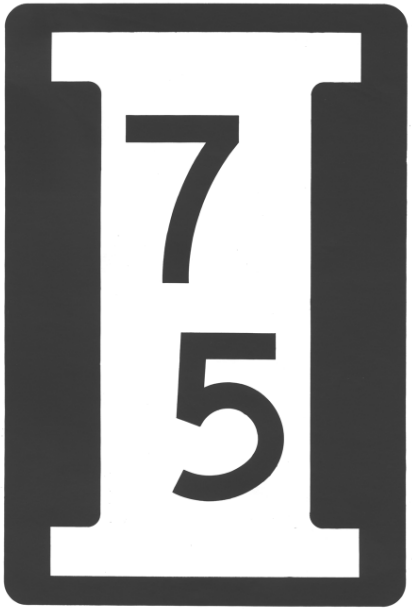
- **I-90, 3, 020.54 miles; from *Seattle, Washington*, to *Boston, Massachusetts*,**
- **I-80, 2, 899.54 miles; from *San Francisco, California*, to *Teaneck, New Jersey*,**
- **I-40, 2, 555.40 miles; from *Barstow, California*, to *Wilmington, North Carolina*,**
- **I-10, 2, 460.34 miles; from *Los Angeles, California* to *Jacksonville, Florida*, and**
- **I-70, 2, 153.13 miles; from *Cove Fort, Utah*, to *Baltimore, Maryland*.**

Among the 2-digit Interstate routes, the five shortest are:

- **I-73, 12.27 miles; *Emery* to *Greensboro, North Carolina***
- **I-97, 17.62 miles; *Annapolis* to *Baltimore, Maryland***
- **I-99, 53.00 miles; *Bedford* to *Bald Eagle, Pennsylvania***
- **I-19, 63.35 miles; *Nogales* to *Tucson, Arizona***
- **I-66, 74.80 miles; *Strasburg, Virginia* to *Washington, D.C.***

The shortest Interstate route segment is I-95 in the District of Columbia which is 0.11 mile long.

The official Interstate sign was also unveiled in September 1957. The states had submitted designs that AASHO then narrowed to four. Full-size versions of the signs were erected on a road near the AASHO road test site while a special meeting of the organization was underway in August 1957. State highway officials were able to observe the signs in daylight, dark, rain and shine. They decided on a combination of designs submitted by *Missouri* and *Texas* - the now familiar red, white, and blue shield.



<u>Above</u>: some ideas submitted by states for Interstate signage

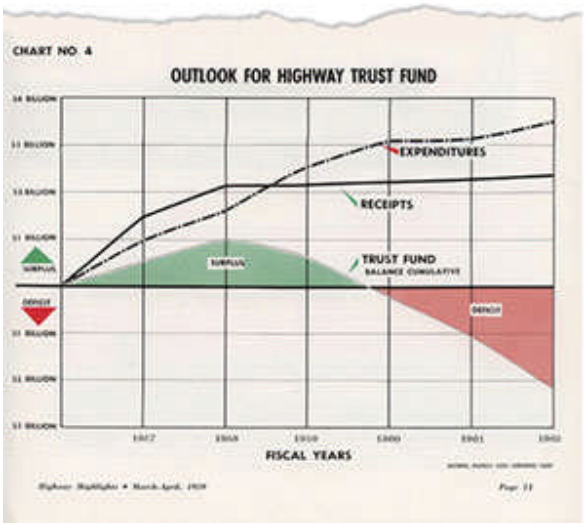
The States typically use one of two methods of numbering the Interstate interchange exits.

• <u>The *Consecutive* numbering system</u>. Starting at the most westerly or southerly point on each Interstate route, interchanges are numbered consecutively. Thus the first interchange becomes Interchange No. 1 while each succeeding interchange is numbered consecutively as Nos. 2, 3, 4, etc.

• <u>The *Milepost* numbering system</u>. All Interstate routes are mile-posted beginning at the most westerly or southerly point. The beginning point is milepost "0." If the first interchange on the route is located between milepost 4.0 and 5.0, it is numbered as Interchange No. 4. The next interchange, if located at milepost 8.7, would be numbered as Interchange No. 8, etc. With this system the motorist can easily determine the location and distance to a desired interchange.

Problems & Solutions

As the first fiscal year of the Interstate program ended in June 1957, Federal Highway Administrator Tallamy reported that, based on engineering and economic studies, BPR had approved 80% of the locations within the original 40K-mile limit. Furthermore, state highway agencies completed improvements on 737 miles of the Interstate System at a total cost of $173.3 million (Federal share: $117.8 million). BPR added that planning and construction were "going on at a furious pace throughout the Nation." But Tallamy also acknowledged that problems had been encountered. For example, he noted that engineers and steel were in short supply. Another problem was a requirement in the 1956 act that the states hold public hearings to consider the economic effects of the location if a Federal-aid highway project involved bypassing or going through a city, town, or village. Right-of-way acquisition was another concern because so much of the Interstate System would be built on new locations. State highway agencies had rarely needed to acquire land or to do so by eminent domain. Thus, the states needed new legislation, standards and appraisers - post-haste. The first problems arose in *Indiana*, where speculators were buying land in the Interstate corridors to resell to the state at inflated values. However, he greatest shock of 1957 involved the urban routes, which - contrary to the estimate of requiring just $4 billion of the total $27 billion - would consume about half of the Interstate funds. Despite the real problems and dire predictions, the highway community had much to celebrate as 1957 ended. The states broke the record in dollars invested in all highway development by spending nearly $4.6 billion. Through December 1st 1957, more than $1 billion in Federal and State funds had been committed to Inter-state projects, and projects totaling $247 million were completed.



<u>Above</u>: caption: "The National Highway Users Conference used this chart to illustrate the problems affecting the *Highway Trust Fund* in the late 1950s. The group explained: 'The ascending solid black line represents cash receipts coming in each year to the Fund; the broken black line, annual cash expenditures. The shaded green areas show the cumulative surplus in the Trust Fund, and the shaded red areas the cumulative deficit.'" By August 1957, the nation had slipped into a recession that would increase unemployment to 7% and reduce corporate profits by 25% by April 1958. One of the reasons Ike had promoted the Interstate System was to counteract just such a situation; have a large public works program in-place that could be expanded or contracted to influence the economy. To stimulate the stagnant economy and avoid losing momentum, *Congress* passed the "Federal-Aid Highway Act of 1958." It increased Interstate funding by $800 million for FY's 1959 through 1961 and included an emergency increase of $400 million for the Federal-aid systems in FY 1959. Because these increases occurred without a change in taxation to boost revenue, the 1958 act also suspended the 1956 law's "Byrd Amendment" (named for deficit hawk Senator *Harry Flood Byrd*) which required the Commerce Secretary to hold apportionments below the point of creating red ink in the Highway Trust Fund. President Eisenhower approved the legislation in April 1958, just as the recession was ending. By the end of 1958, Interstate construction expenditures exceeded trust fund receipts. Additional income would be needed to avoid reduced apportionments in FY 1961 under the restored Byrd Amendment. The looming crisis led many in the highway community to fear what the *American Road Builders Association* (ARBA) described as "a complete collapse of work on the Interstate System."

To maintain the construction schedule, Ike recommended a temporary 1.5-cent increase in the gas tax, but the *Federal-Aid Highway Act of 1959* added only a penny (increasing the tax to 4 cents a gallon) through June 1961. The legislation, which the President approved on September 21st 1959, also reduced FY 1961 Interstate authorizations to $2 billion, but because of the Byrd Amendment BPR could apportion only $1.8 billion. Critics attributed the funding imbalance to "gold-plating," especially in urban areas. They created the term "90-itis" to describe the attitude of state highway officials who, they said, had no reason to be economical because the Federal Government was picking up 90% of the cost. Ike asked a member of his staff; Major General *John Bragdon* (*U.S. Army*, ret.), to study the Interstate program with attention to delineating Federal vs. State and local responsibilities in financing, planning and supervising the highway program. Bragdon also would be responsible for determining ways to improve coordination between planning for Federal-aid highways and state and local planning, especially for urban areas.

Urban Revolt

"…not a study of the real problems…jammed through Congress so blithely and lightly on a dubious pretext…a necessary part of our defense program…nonsense…there is no defense against total extermination in nuclear warfare, no defense except peace."

***Lewis Mumford*, Architectural Critic**

RE: his criticism of *Congress* for the *Interstate Highway System* as being poorly planned and conceived for urban areas. In reaction to the intensity of objections to the Interstate System from many quarters, in October 1958 a summit was held at *Syracuse University* whereby the highway community tried to regain good will. Committees of the *American Municipal Association*, AASHO and *Highway Research Board* joined the university in what was dubbed the first "National Conference on Highways and Urban Development." Funded by the *Automotive Safety Foundation*, the conference featured highway officials and elected officials (primarily mayors) who supported the goal of making the Interstate System work for the orderly development of urban communities. However, critics such as Lewis Mumford were not invited. A "grand accounting" by which the advantages and disadvantages of each alternative for highway users and the community were to be evaluated was the conference's goal.

"...a vast program thrown together, imperfectly conceived and grossly mismanaged, and in due course becoming a veritable playground for extravagance, waste, and corruption."

***The Wall Street Journal* (ca. 1960)**

"…the crisis has come. In one metropolis after another, the plans have been thrown together and the bulldozers set to work…almost any effort to think a bit about what we are doing would help…it will be necessary to investigate the investigators…We may yet impart some sanity and public purpose to this vast enterprise…Roads can make or break a Nation."

RE: in an article entitled: "New Roads and Urban Chaos" (appearing in the April 14th 1960 issue of *The Reporter* magazine), author *Daniel P. Moynihan* - a college professor who had served on the staff of New York State Governor *Averill Harriman,* outlined his concerns over the impact of the Interstate System on urban areas (excerpted above). Future U.S. Senator for *New York* Moynihan was certain pending congressional investigations would turn up corruption, incompetence and thievery and he hoped for a serious reappraisal of the whole Interstate Highway program with the coming of a new presidential administration in January 1961.

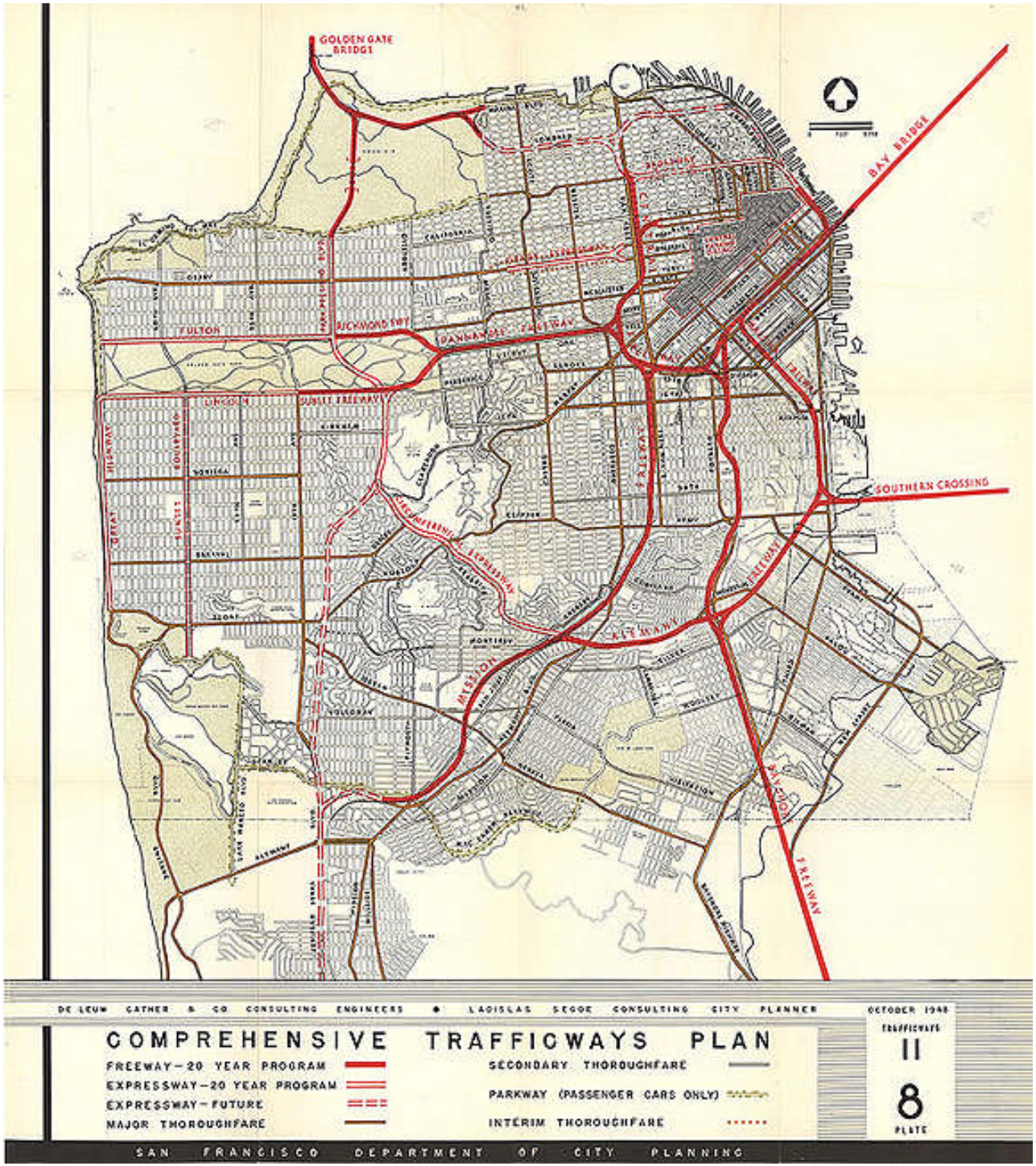
Several cities were resistant to Interstates, particularly from those whose homes or businesses would be acquired by eminent domain for rights-of-way. In *San Francisco*, opposition focused on the *Embarcadero Freeway* (I-480) that was to link the San *Francisco-Oakland Bay Bridge* (I-80) with the *Golden Gate Bridge* (U.S. 101). City officials had proposed the freeway in 1943 as a way of using a needed transportation artery to revitalize a blighted area near the *Ferry Building* and a former farmer's market. State highway officials used a double-deck design that they considered "an ultramodern highway facility." After the initial section opened in February 1959, it came to symbolize what the *San Francisco Chronicle* called "a crime which cannot be prettied up."

Left: caption: "One of the earliest Interstate battles took place in San Francisco, CA, where the double-decked Embarcadero Freeway (I-480) became a focal point for objections. Although additional construction was blocked, the freeway remained in place until it was damaged by the Loma Prieta Earthquake in October 1989."

Right: caption: "Taking down the freeway north of Market Street in early 2000s."

On October 1st 1953, just three years earlier, *San Francisco* had opened its first section of freeway; the *Bayshore Freeway.* San Franciscans could now drive three unmolested miles of "divided no-stop freeways." But as the plans unfolded, public opposition grew. By the time the *Embarcadero Freeway* along the city's waterfront was under construction in 1958, a loud opposition had formed, going on to campaign for its removal after its completion. Over 30K people signed petitions at meetings organized in a half-dozen neighborhoods. In January 1959, the *Board of Supervisors of the City and County of San Francisco* met to discuss the proposed *Western Freeway* (I-80) through the *Sunset District*. The board adopted a resolution opposing construction of all freeways in the *San Francisco Master Plan*. The resolution cited: *"the demolition of homes, the destruction of residential areas, the forced uprooting and relocation of individuals, families and business enterprises"* (as well as the loss of property from the tax rolls). Seven of ten planned freeway routes through the city were cancelled by the city, much to the shock of the *California Department of Highways* and the Federal Government.

<u>Above</u>: caption: "Freeway protesters march along waterfront with unfinished Embarcadero Freeway behind them. In distance is Ferry Building where it was walled off by the double-decker freeway."



Freeway builders continued to resurrect various routes around and across the city, encountering heavy, persistent and very well-organized resistance by *San Francisco* activists. In 1964, the battle over the *Panhandle-Golden Gate Park Freeway* came to a climax with a May 17th 1964 rally to save the park. On October 13th 1964, in a six-to-five vote, the *San Francisco Board of Supervisors* rejected the Park Freeway.

Left: caption: "1948 trafficways plan for San Francisco, with plans for freeways crisscrossing the city and destroying many of its best neighborhoods."

The 1961 ICE (Interstate Cost Estimate), submitted to *Congress* on January 11th 1961, put the total cost of the Interstate System, including past expenditures, at $41 billion (Federal share: $37 billion). Based on work underway and previous authorizations of $25.4 billion, Congress would have to authorize an additional $11.5 billion to complete the Interstate construction program on schedule or scale it back. As the Eisenhower Administration came to an end on January 20th 1961, 10,440 miles, or 25%, of the Interstate System was open to traffic and more than $10 billion was spent. Lingering concerns would need to be addressed by incoming POTUS *John F. Kennedy* and his appointed officials. General *L. W. Prentiss*, executive vice president of ARBA, put the situation facing the Interstate System in stark terms: *"The highway program is in for the battle of its life."*

Our Great Big Highway Bungle

Even as construction of the *Interstate Highway System* progressed at a record pace, a looming fiscal crisis threatened to derail the schedule, if not the entire program. According to the 1961 ICE, *Congress* would have to provide an additional $11 billion to maintain the schedule. Controversy dogged construction in urban areas. The press repeated tales of alleged corruption and bungling that had given the program the disparaging label: "our great big highway bungle." On November 8th 1960, Senator *John F. Kennedy* won the presidential election. Eisenhower and his successor were from different generations and political parties, but Kennedy shared Ike's concern about the future of the *National System of Interstate and Defense Highways*, recognizing its importance to the economy and future of the nation. President-elect Kennedy selected Governor *Luther H. Hodges* of *North Carolina* to be Secretary of Commerce. Within that agency, the new Federal Highway Administrator of BPR would be *Rex Whitton*. Whitton's career with the *Missouri State Highway Agency* had begun in 1920 when he accepted a job operating a level on a survey crew for $110 a month, plus field expenses. He became chief engineer in 1951, leading to his role as president of the AASHO in 1956. Whitton represented AASHO before Congress during that critical year and oversaw revision of the 1945 geometric design standards for the Interstate System. The new edition was approved in July 1956 and quickly adopted by BPR. Whitton also had ensured in August that *Missouri* would have the first project to go to contract after President Eisenhower approved the *Federal-Aid Highway Act of 1956*. Whitton became the third Federal Highway Administrator on February 10th 1961.

"…Increased public education is essential in the face of the negative publicity…There is no instant panacea for the trouble besetting the highway program…can and must be completed by 1972…give the job everything I have."

RE: in his first speech as Federal Highway Administrator (to a meeting of ARBA in *Atlantic City, NJ* in March 1961), Whitton identified three problems that required resolution:

- **Funding**
- **Scandals**
- **Public Apathy**

With funding being the priority, Whitton explained that, in 1959, President Eisenhower had signed legislation increasing the gas tax to 4 cents per gallon as a temporary measure that would expire July 1st 1961, returning the tax to 3 cents. The reduction was vigorously opposed by the new administration. Whitton recommended tax changes that would add $9.7 billion over roughly a ten-year period, or about $900 million per year, for the Interstate program. On June 29th 1961, exactly five years after President Eisenhower had approved the 1956 law, President Kennedy approved the "Federal-Aid Highway Act of 1961." The new law made the 4-cent gas tax permanent and adjusted other excise taxes to support completion of the Interstate System on the basis of the latest ICE. It also adjusted remaining authorizations for the system to a total of $25.2 billion over nine years. With state matching funds, the legislation accounted for $27 billion in funding for the remainder of the program through FY 1971 - the same amount *Congress* had allocated in 1956 to cover the total cost of the program. After President Kennedy signed of the 1961 act, completion of the Interstate System was never again in doubt.

***"…to increase their joint planning at every level, to improve coordination of urban renewal and freeway construction plans in the same area, and to invite the cooperative efforts of State and local highway and housing officials and private experts…reasonable housing at reasonable costs has been largely overlooked*, "**

POTUS *John F. Kennedy*, 1961

RE: in addressing urban development issues, Kennedy directed Commerce Secretary *Luther Hodges* and Housing and Home Finance Administrator *Robert C. Weaver* to coordinate their efforts. He also encouraged legislation to help families displaced by highway construction.

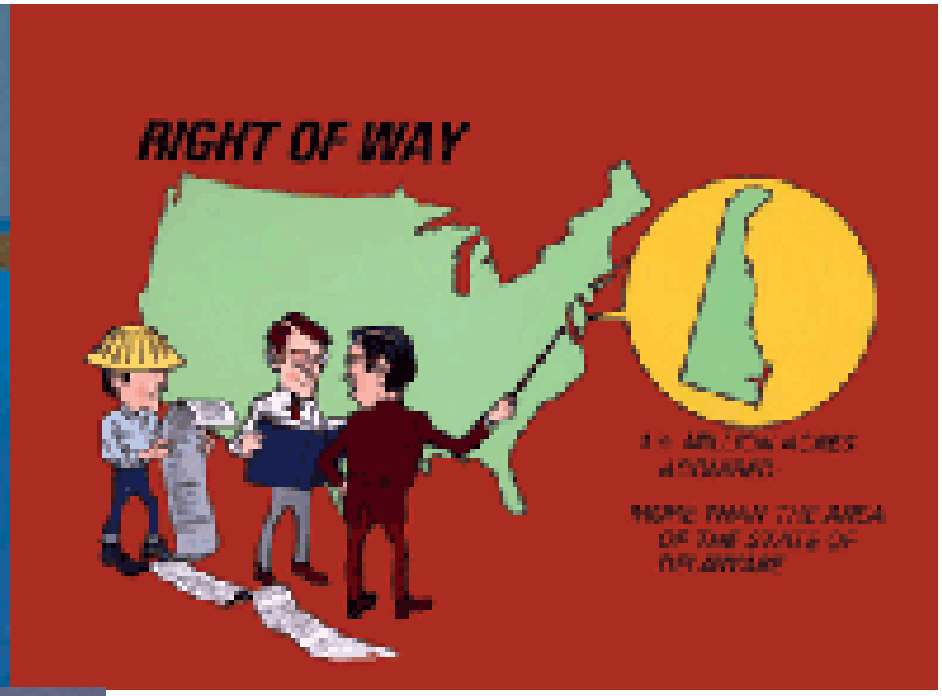
National Highway Week

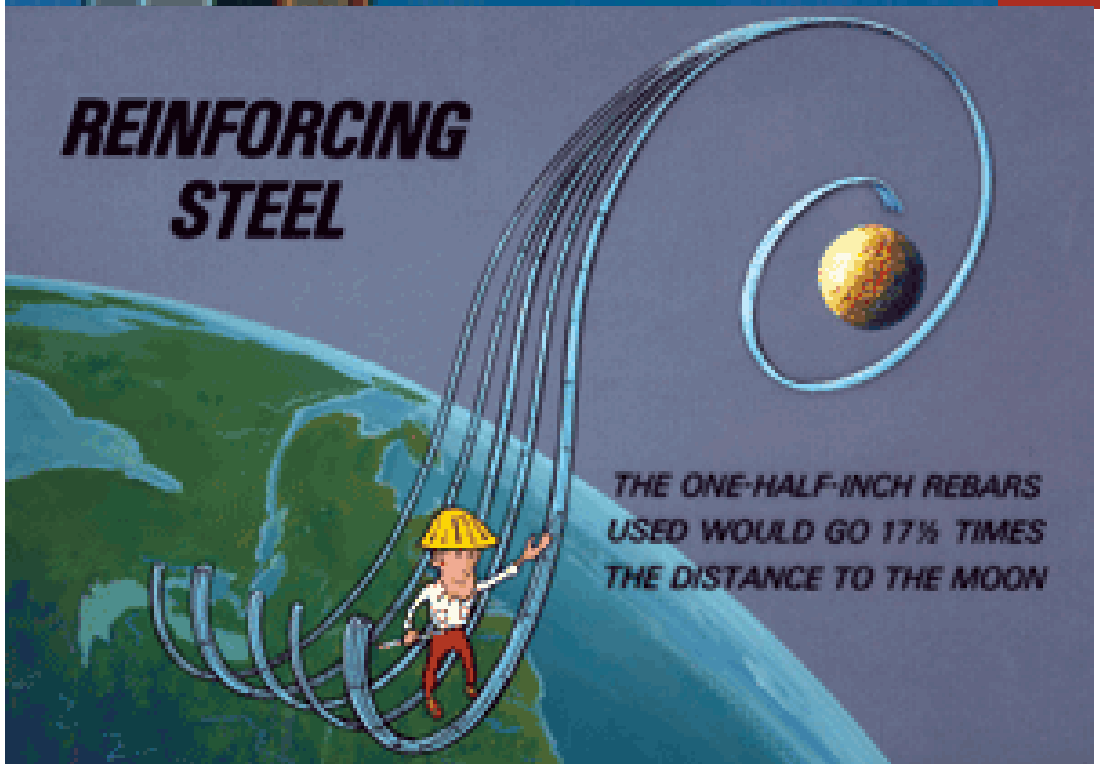
"…Today, wherever we look throughout our country, we find that the Interstate System is spurring new industrial and commercial development, creating new jobs, and generating new economic growth for the benefit of all Americans."

RE: excerpt from article authored by Federal Highway Administrator *Rex Whitton* (left), appearing in Sunday newspapers around the country in August 1964. In April 1961, President Kennedy issued a proclamation declaring that the week of May 21st through 27th 1961 would be "National Highway Week." It was an opportunity for Federal and State highway officials and the nation's governors to remind the public of the "vital role of highway transportation in our way of life." Whitton began a public relations initiative to counter the bad press the Interstate program was receiving. The campaign included his appearance at highway openings around the country, each an opportunity to gain positive publicity in local newspapers. By the time he left office in December 1966, Whitton had attended more Interstate openings than any Federal Highway Administrator before or since. As he traveled the country, Whitton continued to meet with the press to share his optimism about the future awaiting the country in the early 1970's when the Interstate System would be completed.

<u>Left</u>: caption: "Rex Whitton participated in more opening ceremonies for Interstate highways than any other Federal Highway Administrator. Here he is shown marking the opening of Virginia's portion of the Capital Beltway (I-495) on April 2, 1964."

<u>Right</u>: caption: "Capital Beltway - Maryland - The final link in the Capital Beltway around Washington, D.C. is opened in ceremonies on August 17, 1964, with Federal Highway Administrator Rex Whitton and Maryland Governor Millard Tawes cutting the ribbon, and John B. Funk, Chairman of the Maryland State Highway Commission, assisting."





<u>Above & Left</u>: caption: "To illustrate the magnitude of the 'greatest public works project in history,' BPR prepared these illustrations in 1961 showing how much concrete, right-of-way, and reinforcing steel would be needed."

The Great Highway Robbery

"Corruption permeates the highway program and stigmatizes the whole road-building industry."

Representative *John A. Blatnik*, Chairman - Special House Subcommittee investigating corruption in the *Federal-Aid Highway Program*

RE: in the February 4th 1962 issue of *Parade* magazine, investigative journalist *Jack Anderson* wrote about "The Great Highway Robbery," quoting representative Blatnik in the article. The Blatnik committee cited examples of graft, payola, abuse of right-of-way appraisals and poor judgment, predominantly in smaller states. In response, In July 1962, BPR – in cooperation with the *Blatnik Committee*, FBI, *General Accounting Office* (GAO) and state investigative units, established the "Office of Right-of-Way and Location." The new office would be responsible for route location and ensuring that right-of-way would be acquired properly and at fair cost. In addition, former FBI agent *Joseph M. O'Connor* would direct a new "Office of Audit and Investigations," which would probe allegations of fraud, land speculation, collusion and other irregularities as well as audit state claims for reimbursement of the Federal share of project costs. Simultaneously (beginning in May 1961), the Blatnik Committee issued reports on its findings. The reports covered a variety of topics including highway construction practices, right-of-way acquisition, the relationship between road contractors and state personnel as well as disposition of right-of-way improvements. The Blatnik Committee, combined with policing efforts by BPR, state highway agencies and investigative agencies defused the crisis. The allegations would resurface in later critical articles and books, but the danger to the Interstate Highway program had passed.

"…the achievement of sound land-use patterns, the assurance of transportation facilities for all segments of the population, the improvement in overall traffic flow, and the meeting of total urban transportation needs at minimum cost…consistent with adequate, comprehensive development plans for the metropolitan area or are based on results of a continuing process carried on cooperatively by the States and local communities...will be an integral part of a soundly based, balanced transportation system for the area involved."

RE: in March 1962, Commerce Secretary Hodges and Housing and Home Finance Administrator Weaver reported to President Kennedy on redressing urban transportation problems, outlining their major objectives. Their report recommended that beginning July 1st 1965, approval of Federal-aid highway projects in any metropolitan area should be contingent on a finding by the Commerce Secretary.

The Transportation System of Our Nation

"An efficient and dynamic transportation system is vital to our domestic economic growth, productivity, and progress. Affecting the cost of every commodity we consume or export, it is equally vital to our ability to compete abroad. It influences both the cost and the flexibility of our defense preparedness, and both the business and recreational opportunities of our citizens…to authorize payments not to exceed $200 in the case of individuals and families and $3,000...in the case of business concerns or nonprofit organizations displaced as a result of land acquisitions under these programs."

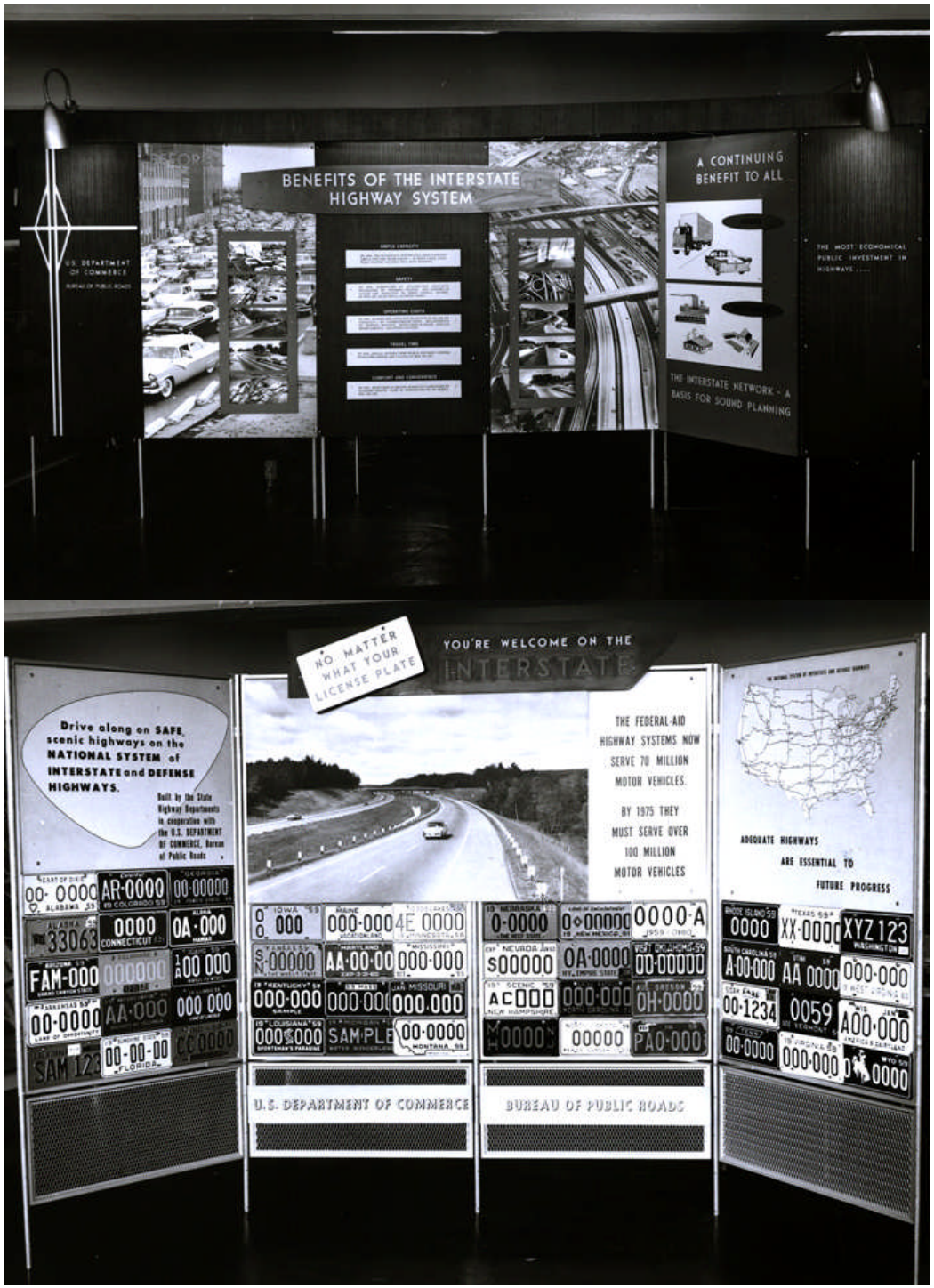
POTUS *John F. Kennedy*

RE: in April 1962, President Kennedy submitted a message to *Congress* on "The Transportation System of our Nation." The message covered a wide range of topics related to transportation. Kennedy recommended that Congress establish a long-term program of Federal aid to urban mass transportation ($500 million over three years) in the form of direct grants to public agencies. Because highways would remain an "instrumental part" of urban transportation, the President asked for changes in *U.S. Department of Commerce* policy and Federal law to bring urban Federal-aid highway construction more in line with the comprehensive development plans for metropolitan areas. In addition, he cited Secretary Hodges's estimate that 15K families and 1,500 businesses were being displaced by Interstate construction each year. With Federal urban renewal programs as a model, Kennedy submitted legislation to authorize compensation for displacement due to *Interstate Highway construction.*

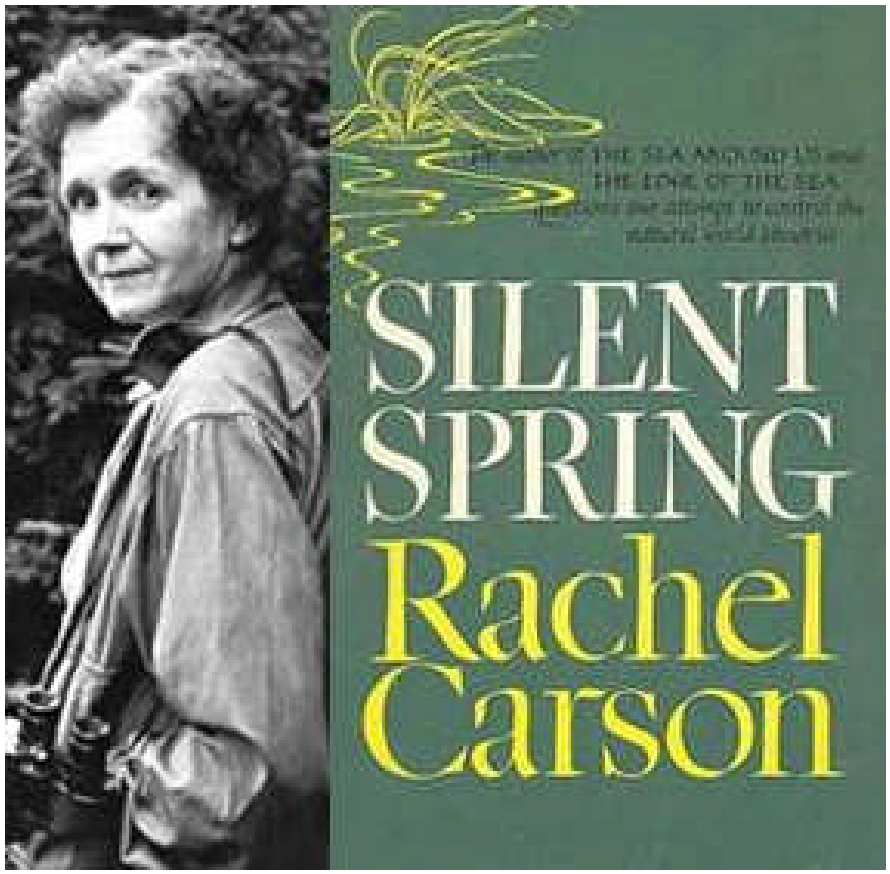
Nothing Succeeds Like Success

Left: caption: "In December 1962, Federal Highway Administrator Rex Whitton challenged the American Association of State Highway Officials to finish half the Interstate System by the midway point in the program, which was then expected to end in 1972. This exhibit was created to illustrate the challenge." In December 1962, AASHO gathered for its annual meeting, Federal Highway Administrator Whitton included a challenge for State highway officials in his address to the convention. Given the continuing criticism of the Interstate program, Whitton pointed out that "nothing succeeds like success." Each Interstate highway, he said, "is its own best advertisement" of the benefits of freeways. Building the Interstates as fast as possible was "the best means we have to combat the carping critics and mudslingers." With the Interstate program funded through FY 1971, the halfway point was 1964 for the fifteen-year program. Therefore, Whitton challenged state highway officials to complete 50% of the Interstate System, or 20K miles, by the end of 1964. He urged the states to focus on projects that would link longer route sections (especially those connecting large cities). Such routes, he said, "best demonstrate to the public the benefits of the system - time saving, travel ease, and safety."

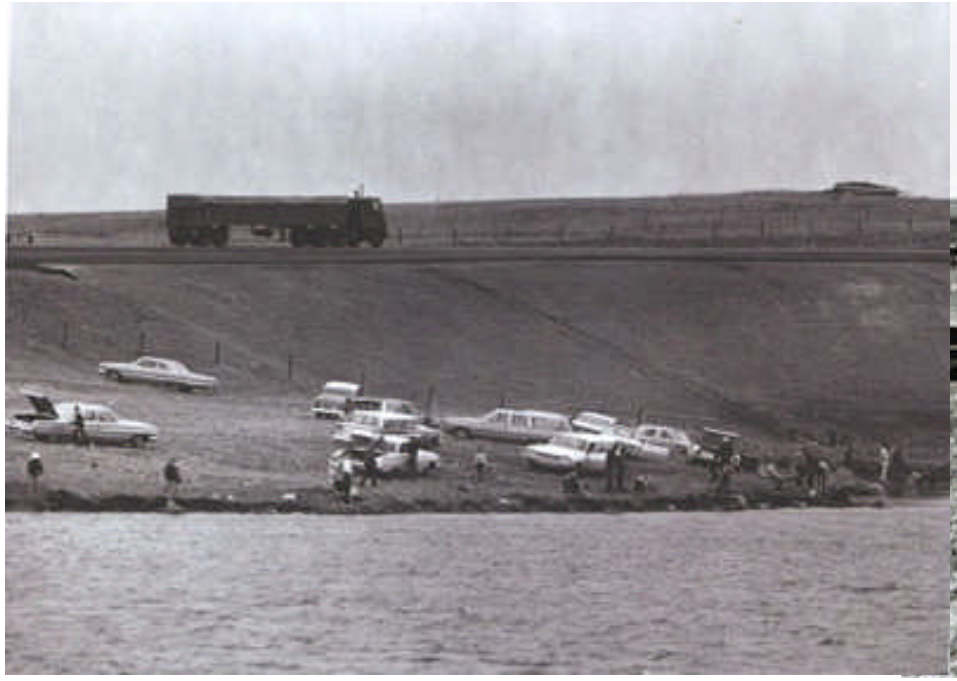
Right: caption: "Washington - Exhibit featuring Washington State's segments of the National System of Interstate and Defense Highways (I-5,I-90, and I-82) at the U.S. Bureau of Public Roads (1963)"


BENEFITS OF THE INTERSTATE HIGHWAY SYSTEM
A CONTINUING BENEFIT TO ALL
THE INTERSTATE NETWORK - A BASIS FOR SOUND PLANNING
NO MATTER WHAT YOUR LICENSE PLATE
YOU'RE WELCOME ON THE INTERSTATE
Drive along on SAFE, scenic highways on the NATIONAL SYSTEM of INTERSTATE and DEFENSE HIGHWAYS.
Built by the State Highway Departments in cooperation with the U.S. DEPARTMENT OF COMMERCE, Bureau of Public Roads
THE FEDERAL-AID HIGHWAY SYSTEMS NOW SERVE 70 MILLION MOTOR VEHICLES.
BY 1975 THEY MUST SERVE OVER 100 MILLION MOTOR VEHICLES
ADEQUATE HIGHWAYS ARE ESSENTIAL TO FUTURE PROGRESS
U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

The Quiet Crisis



In September 1962, a turning point came with the publication of Rachel Carson's book "Silent Spring." Though it had nothing to do with the Interstate System, *Silent Spring*, which described the effect of chemicals such as DDT on the environment, was an immediate international bestseller and made the environment a major national concern. After *Silent Spring*, the public began to see the relationship between human endeavors that, however well intended, had adversely affected the environment. This "quiet crisis," as Interior Secretary *Stewart Udall* called it in 1963, would require "new conservationists" in the form of ecologists, botanists and biologists. The quiet crisis would soon become another concern that highway engineers had not anticipated.



"We do not seek to despoil the countryside. Our responsibility is to spend the highway users dollar wisely…we do not have closed or calloused minds."

Federal Highway Administrator *Rex Whitton*

RE: prior to the publication of *Silent Spring*, for BPR and the states the location of highways had not involved concerns about the environment. Rather, road builders sought the best routing to provide traffic service at the lowest cost with the least disruption to homes and businesses. Now, new criteria would have to be considered. Less than a year after publication of the book, BPR announced (in August 1963) that beginning January 1st 1964, the states would be required to certify, for each Federal-aid highway project, that they had considered its possible effects on fish and wildlife. Although Whitton would present the new requirement as a "conservation" measure, it was one of many steps the highway engineers would take - willingly in some cases, not so willingly in others, to adjust to an evolving public awareness that meeting transportation needs had environmental consequences that should be considered along with congestion relief, economic development, safety and other traditional factors.

<u>Above L&R</u>: caption: "North Dakota - This lake is impounded by Sweet Briar Dam, which is a section of Interstate 94. The use of the highway as a dam was made possible by the cooperation of Federal, State and local agencies."

Partnership for Progress


"It symbolizes...first of all, the partnership between the Federal Government and the States, which is essential to the progress of all of our people; and secondly, it symbolizes the effort we have made to achieve the most modern Interstate highway system in the world, a system which, when completed, will save over 8,000 lives a year and $9 billion in cost. And third, it symbolizes the effort which we are giving and must be giving to organizing an effective communication system here in the United States of America."

POTUS *John F. Kennedy*

<u>Above L&R</u>: caption: "The Maryland Northeastern Expressway-Delaware Turnpike opens with President John F. Kennedy helping to cut the ribbon." On November 14th 1963, President Kennedy helped open the *Maryland Northeastern Expressway* and the *Delaware Turnpike* (I-95), which were separate state toll roads that met at the state line. More than 10K people attended the ceremony (staged at the State Line) for what would prove to be the only time a POTUS has participated in an Interstate opening. In October 1963, President Kennedy had approved the "Federal-Aid Highway Amendments Act of 1963," a technical corrections bill that contained an important change in the design of Interstate projects. The 1956 law had called for Interstate projects to be designed to meet traffic demand in the year 1975. As that year came closer, Federal and State highway officials and key members of *Congress* began to worry about construction of highways that would soon be obsolete. Thus, the 1963 act required design for a twenty-year period commencing on the date of plan approval. Later, the "Federal-Aid Highway Act of 1966" made another key change in design standards by requiring that: "such standards shall in all cases provide for at least four lanes of traffic."

Eight days after attending the opening ceremonies of *The Maryland Northeastern Expressway-Delaware Turnpike*, on November 22nd 1963 President Kennedy was assassinated in *Dallas, Texas.* In January 1965, during a ceremony in the lobby of a *Hot Shoppes* restaurant on the *Delaware Turnpike*, Governor-elect *Charles L. Terry, Jr.* of *Delaware* unveiled a bust of the late President by sculptor *Maurine Ligon* of *New Castle, DE*. With the unveiling, the highway spanning Delaware and Maryland was officially renamed the: "John F. Kennedy Memorial Highway."

A New Conservation

"If it's beautifying they want, it's beautifying they'll get"

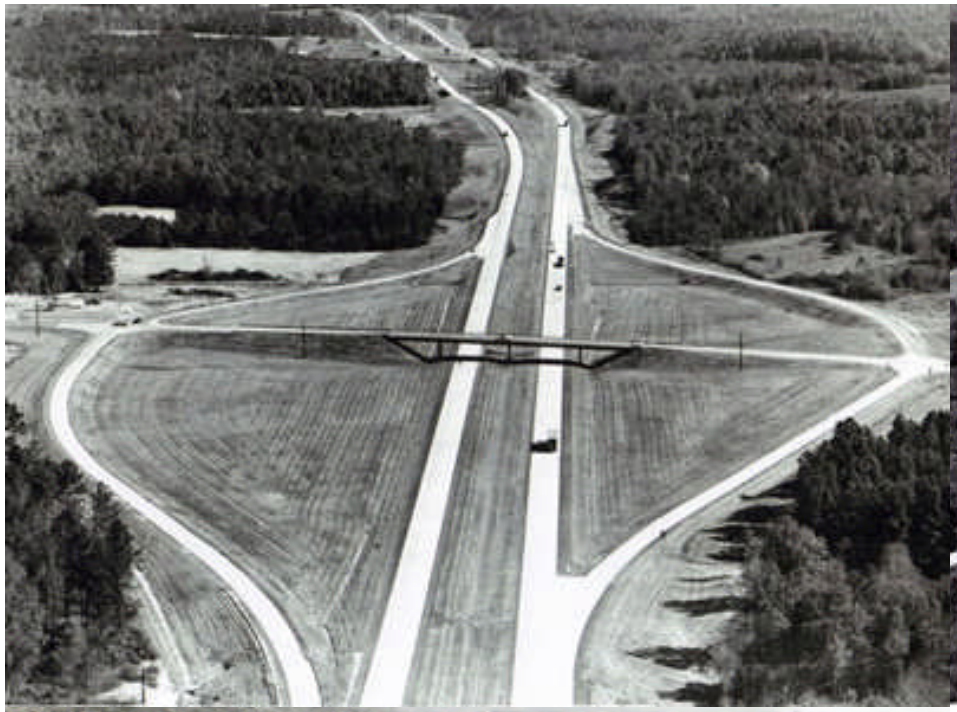
POTUS *Lyndon Baines Johnson*

RE: in November 1964, President Johnson won a landslide victory over Senator *Barry Goldwater.* During the campaign, *Lady Bird Johnson* had complained to her husband about the roadside junkyards they saw along the campaign trail. Johnson observed during the campaign that references to the problem garnered applause. Astute politician that he was, he determined to give the people what they wanted. Thus, on February 8th 1965, within just three weeks of renewing his oath of office, Johnson wrote to *Congress* on the stewardship of the nation's natural beauty. He called for "a new conservation" that included proposals for cities, rivers and trails as well as ideas for curbing pollution. Johnson directed the Commerce Secretary to ensure that landscaping would be part of all Interstate and Federal-aid primary and urban highways. Johnson also planned to introduce legislation on effective control of billboards and "unsightly, beauty-destroying junkyards and auto graveyards along our highways."

<u>Top Left</u>: caption: "Alabama - Separate roadways fitted into the landscape, as seen beyond the diamond interchange, are typical of design on Interstate Route 59 between Argo and St. Clair Springs."

<u>Top Right</u>: caption: "Massachusetts - Independent roadway design and a wide median help fit Interstate Route 95 into the landscape in between Attleboro and Sharon."

<u>Left</u>: caption: "Georgia- Views of Interstate 85 in northeast Georgia, one of six routes cited for imaginative excellence in design and construction in PARADE magazine's 1965 Scenic Highway Contest."



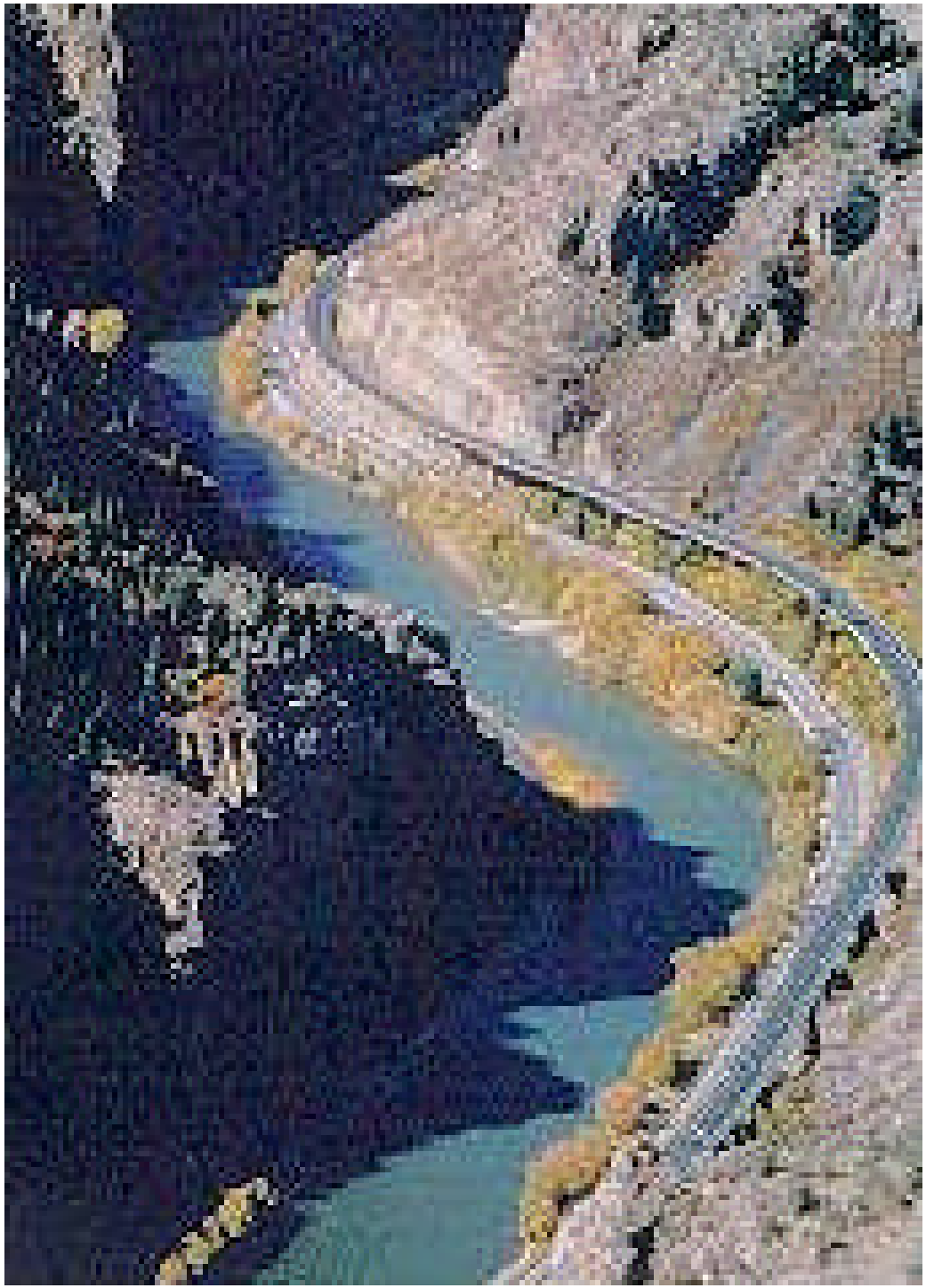
<u>Top Left</u>: caption: "Georgia - View of Interstate Route 85 in northeast Georgia, one of six routes cited for imaginative excellence in design and construction in PARADE magazine's 1965 Scenic Highway Contest."

<u>Top Right:</u> caption: "Georgia - The interchange between Interstate Route 285 (Bottom-Top) and Interstate 75 (Right-Left) northwest of Atlanta, Illustrates the beauty achieved through varying roadway elevations and median width and selective clearing in the original design and construction of a highway."

<u>Left</u>: caption: "New Hampshire- Interstate Route 93 near Sanbornton, illustrates the use of independent roadway design and the preservation of trees on the roadside and in the median, for scenic effect and economy.

<u>Above L&R</u>: caption: "New York – A view along the 23-mile section of the Adirondack Northway (Interstate Route 87) which was adjudged America's Most Scenic New Highway of 1966 by PARADE magazine. The section, between Lake George and Potterville in Warren County, is part of the 176-mile-long Albany-to-Canada Express-way."

<u>Left</u>: caption: "New York - A view along the 23-mile section of the Adirondack Northway (Interstate Route 87) which was adjudged America's Most Scenic New Highway of 1966 by PARADE magazine. The section, between Lake George and Potterville in Warren County, is part of the 176-mile-long Albany-to-Canada Expressway."



"I-70 follows the Colorado River past manicured mountains, fertile valleys, and breathtaking canyons."

American Automobile Association

"A world-class piece of environmentally sensitive engineering….a scenic byway that is one of the wonders of the interstate system…"

***Thomas Larson*, former FHWA Administrator**

<u>Left</u>: caption: "Glenwood Canyon was one of the most challenging projects in the Interstate Highway System. The highway is a world-class scenic byway and an outstanding environmental and engineering project. Forty-plus bridges and viaducts - including pre-cast box girders; pre-cast I-beams; cast-in place, post tensioned box girders; welded steel box girders; and a tunnel - were used to minimize damage to the setting."

Considerable public concern was demonstrated when Interstate I-93 passed through *Franconia Notch, NH* which features "The Old Man of the Mountain" - a granite outcropping that resembles an old man's face and is a state symbol (right). Many feared that construction of an interstate highway would create vibrations that would undermine the outcropping. The result was a compromise. The 16-km stretch of I-93 through Franconia Notch (left) includes segments of typical interstate highway, a three-lane parkway and a two-lane parkway. In addition, a 14.5-km bike path was constructed. Materials such as naturally stained wood on structures, stonework on bridges and unpainted weathered steel all combine to help keep the park-like atmosphere and natural beauty of the Notch intact. The *I-93 Franconia Notch Parkway* opened in June 1988.

Florida's Alligator Alley - formally called the *Everglades Parkway* - between *Naples* and *Miami* (map at left) was a two-lane toll road that has been upgraded to interstate standards as part of I-75 (top left). Because of concern about the future of the endangered Florida panther, the reconstruction to make the highway "panther-friendly" included under-passes that allow the panthers and other wildlife to cross under the highway (top right). Drainage was also improved to enhance the flow of water within the Everglades.

"They had achieved an engineering marvel: a breathtakingly beautiful man-made rock wall, revealing in tilted, multi-colored layers of sedimentary rock 350 million years of geologic history."

RE: excerpt from a magazine article. *Sideling Hill* in western *Maryland* had been an obstacle to transportation for centuries. Old *U.S. Route 40*, the modern descendant of the *National Road,* executed a treacherous hairpin curve to get around the obstacle. When Maryland officials decided to build an Interstate Highway through western Maryland to connect I-79 in *Fairmont, WV* with I-70 and I-81 in *Hagerstown, Md*., they decided they needed a straightforward crossing of the mountain. To avoid a prohibitively steep grade, they blasted a 116-meter-deep cut into the top of the 536-meter mountain (above L&R). Doing so required blasting, scraping and hauling 3.44 million cubic-meters of shale, sandstone and other rock while maintaining traffic on U.S. 40. In addition, stringent erosion and sediment control requirements, aimed at protecting the trout streams that crisscross the route, complicated the task. When I-68 opened in August 1991, it included the *Sideling Hill Exhibition and Tourist Information Center*, housing geological exhibits. The center includes a fenced walkway onto the Sideling Hill road cut as well as a fenced pedestrian bridge across I-68.

"Somehow, construction of I-15 enhanced rather than distracted from nature's handiwork."

Arizona Highways **magazine, 1988**

<u>Above & Left</u>: caption: "I-15 through the Virgin River Gorge is a scenic wonder through a 500 million-year-old gorge that deftly winds its way through this colorful canyon. Construction of I-15, which opened in 1973, included re-channeling the Virgin River twelve times."

<u>Left</u>: caption: "Washington - The craggy face of Mt. Stewart, masked by winter snows, is just one delightful sample of the scenic vistas opened to motorist upon completion of the I-90 link between Cle Elum and Ellensburg. The 4-lane Freeway climbs gracefully to more than 2,000 feet, sweeping through ever-green-studded elk territory. Two rest areas are planned, one for each direction of travel, at a point chosen for its panoramic mountain view."

Top Left: caption: "Towering cliffs dwarf vehicles near Rattlesnake Bend as I-70 wends through the spectacular scenic area 15 miles west of Green River, Utah. One of the unique engineering challenges of Interstate 70 was the ten-mile section through Spotted Wolf Canyon with its 'V' shaped canyon walls. Rock slabs were split from the walls and used as fill to elevate the roadway. The technique provided sufficient room for the four-lane divided highway and preserved the rugged appearance of the environment."

Top Right: caption: "Virginia- Interstate 77 in Virginia was built in many sections as two individual roadways to avoid disturbing the natural landscape."

Left: caption: "Wyoming - Interstate Route 80 a few miles east of Laramie was designed with independent roadways to overcome economically the difficult topo-graphy."

<u>Above</u>: caption: "In St. Paul, controversy over I-35E resulted in a unique parkway design - four lanes, no trucks that weigh more than 9K pounds, a speed limit of 45 mph, trees and shrubs in the median, and decorative fencing and lighting to blend with downtown redevelopment plans."

<u>Left</u>: caption: "I-35 and Leif Ericson Park Rose Garden with a dramatic view of Lake Superior in Duluth, Minnesota" In Duluth, MN, the *Leif Erikson Tunnel* (opened in October 1992) has been honored by the *Federal Highway Administration* and others for its use of cut and cover tunnels, architectural design treatments and extensive landscaping to integrate the freeway into the surrounding urban environment and create a pleasing driving experience.

<u>Top Left</u>: caption: "Oregon - Oregon has an intensive program to landscape its interchange at the entrances to cities along the freeways as well as landscaping the freeways which run through the cities. Here, the Lombard Street Interchange and Interstate 5 in Portland show the results of that program. A pedestrian spiral, center of Photograph, has been provided for safety purposes."

<u>Top Right</u>: caption: "Oregon - Interstate 5 cuts through some picturesque country in southern Oregon, as it wends its way through the mountains in that area. Every effort was made to preserve as much of the original beauty of this stretch as possible."

<u>Left</u>: caption: "Oregon - Screen planting of Incense Cedar on fill, Interstate 5, in Roseburg. Planted in 1955. These trees are 15-18 feet high." (ca. 1966)

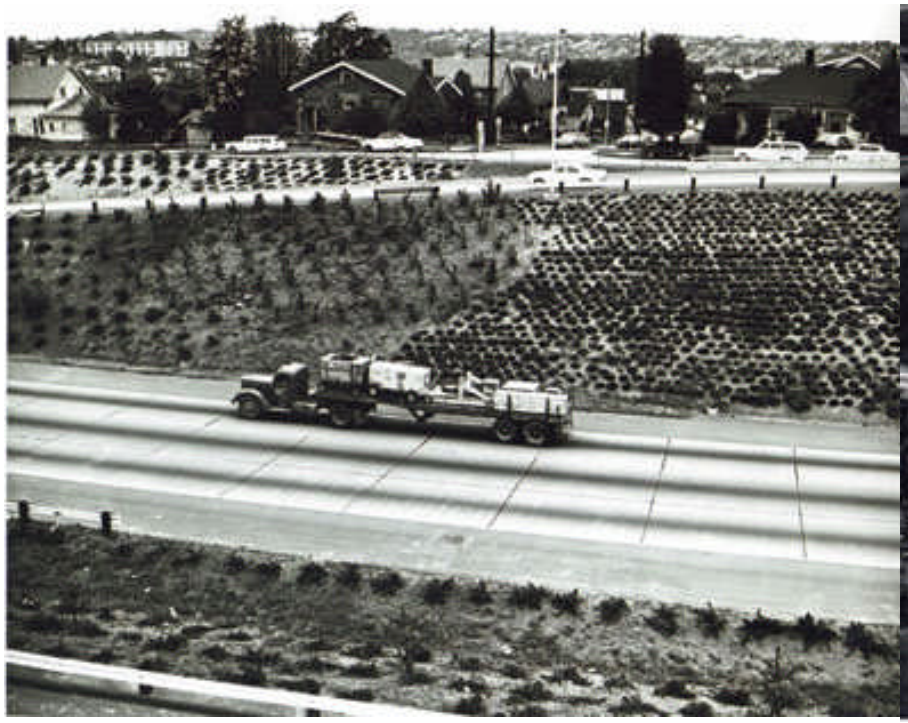
<u>Above</u>: caption: “Oregon - Planting of evergreen groundcover (Arctostaphylos uva-ursi, Kinnikinick) at interchange on Interstate 5 between Albany and Salem. Note also heavy shrub planting on slope beyond crossing. A functional planting that improves appearance and reduces maintenance.”

<u>Left</u>: caption: “Oregon Interstate Route 5 lies below ground level as it passes through a residential area of North Portland, Oregon. Trees and shrubs have been planted along the freeway to enhance it's appearance and to serve as a screen.”

<u>Top Left</u>: caption: "Tennessee Interstate Route 40 descends the western slope of the Cumberland Plateau in Tennessee midway between Nashville and Knoxville. Note the 'split-level' independent roadway design, fitted to the rough topography."

<u>Top Right</u>: caption: "Interstate Route 91 in southern Vermont was designed to blend with the scenery. Here one roadway, skirting a picturesque ledge, is at a higher elevation than the other."

<u>Left</u>: caption: "Tennessee - Federal-aid Highway Section Slope Treatment - I-24 through Missionary Ridge in Chattanooga."



<u>Left</u>: caption: “Washington - Shrubs planted along Interstate 5 north of Seattle help to beautify the highway and prevent erosion.”

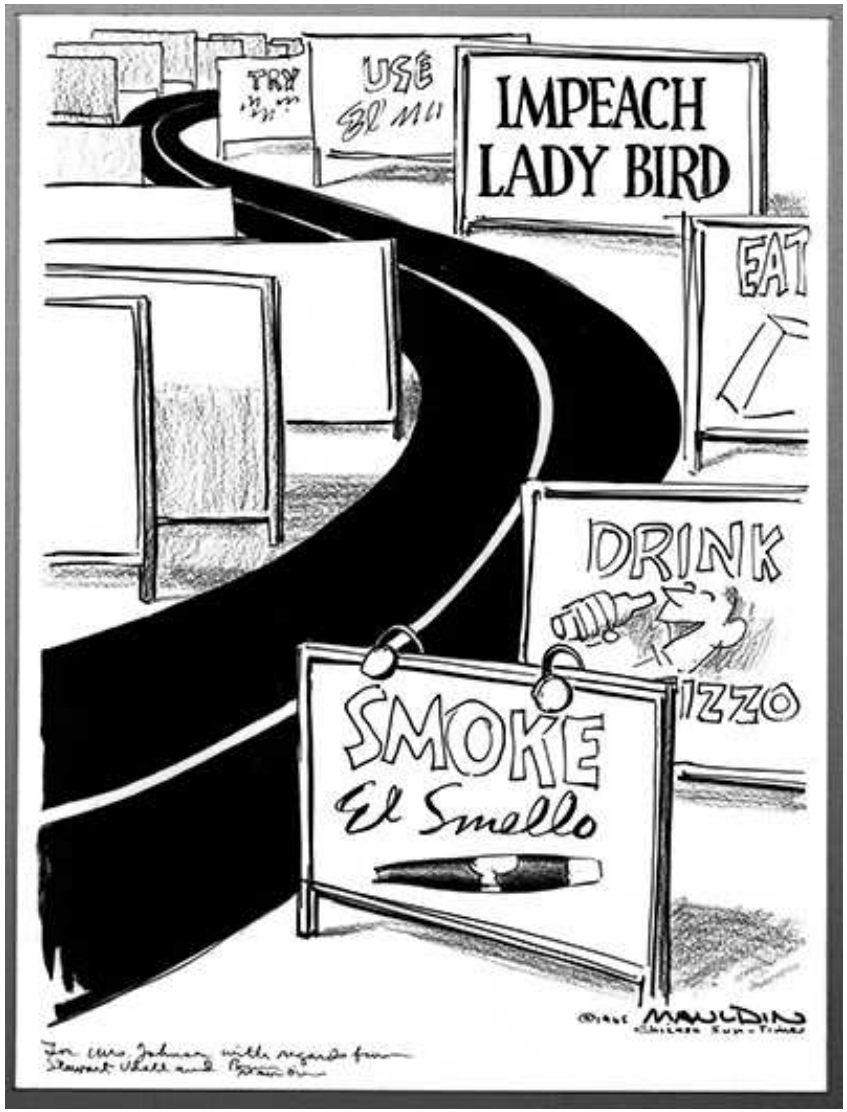
<u>Right</u>: caption: “Wisconsin - These ponds alongside Interstate Routes 90 and 94 in Wisconsin were developed from borrow pits used during the highway construction.”

Beauty Belongs to All the People

"…The highways must be beautiful as seen from the driver's seat...and they also must not be a scourge on the community through which they pass…use every skill that is available including the skills of architects, landscape architects, highway engineers, and psychologists and all the others to create the best possible transportation system and the best possible urban plan for our cities…"

Federal Highway Administrator *Rex Whitton*

RE: President Johnson called for a "White House Conference on Natural Beauty" to be held on May 24/25, 1965 in *Washington, DC*. BPR's Whitton told a conference panel that "highways are for people" - a message he would repeat on many occasions. However, Johnson's well-intentioned "America the Beautiful" initiative proved controversial when the rights of private property owners clashed with the public interest. A good example were highway billboards, which had been criticized for decades but proved difficult to control. The *Federal-Aid Highway Act of 1958* had declared that control of outdoor advertising was "in the public interest." To that end, It authorized a bonus program (with the revenue coming from the general Treasury rather than the Highway Trust Fund) under which states would receive a 0.5% increase in the Federal share of Interstate construction costs if they agreed to control outdoor advertising. However, by 1965, only twenty states (with 25% of Interstate System mileage within their borders) had entered into bonus agreements. Such limited success led to the passage of the "Highway Beautification Act of 1965." It was signed into law on October 22nd 1965 at the *White House*. After signing the bill into law, President Johnson gave the pen to Lady Bird and stated: "Beauty belongs to all the people."



Above: caption: "Johnson's campaign to beautify U.S. highways was not popular with everyone, as evidenced by this 'Impeach Lady Bird' cartoon published in the Chicago Sun-Times."

The billboard portion of the beautification law required states to provide effective control of outdoor advertising along the Interstate System and primary system highways. For states that failed do so, their Federal-aid apportionment could be reduced by 10%. Some signs would be permitted; directional and other official signs, signs and other devices advertising activities conducted on the property on which they were located and signs marketing the sale or lease of the property on which they were located. The Commerce Secretary was to enter into an agreement with each state regarding the size, lighting, and spacing, consistent with customary use, on outdoor advertising. Signs that did not comply with the new requirement were to be removed after July 1st 1970, with just compensation for those that had been erected legally before enactment of the law. The act authorized $20 million per year for FY 1966 and 1967 for this purpose, with the funds coming from the general Treasury - not the Highway Trust Fund, and a Federal share of 75%. To promote the safety and recreational value of travel and preserve natural beauty, the law also required effective control of outdoor junkyards along the Interstates and primary system highways. Effective control meant screening by natural objects, plants, fences or other means, with a 10% penalty on apportionments for states that failed to comply. The Federal share for junkyard screening projects was akin to the outdoor advertising initiative. The first billboard did not come down until April 1971, when a sign in a pine grove off I-95 near *Freeport, Maine* was removed.

Top Left: caption: "Lady Bird Johnson (right) was instrumental in making aesthetically pleasing views from the road an important goal of the Interstate System. In May 1965 she embarked on a "Landscape-Landmark Tour" in northern Virginia, taking I-95 and parallel U.S. 1 to compare the two highways. Mrs. Johnson posed with Federal Highway Administrator Rex Whitton and his wife. "

Top Right: caption: "President Johnson signed the Highway Beautification Act of 1965 on October 21. The first billboard, on I-95 near Freeport, ME, came down under the act in April 1971. Secretary of Transportation John A. Volpe addresses reporters and area residents in front of the first billboard to be torn down."

Left: caption: "Georgia - Highway Department maintenance forces are shown removing a billboard erected in violation of State law controlling outdoor advertising from alongside Interstate 75 in south Georgia during a May, 1965, clean-up of unauthorized signs."

<u>Above</u>: caption: "Rhode Island - Junkyard Screening on I-195"

<u>Left</u>: caption: "Montana - I-15 - Town of Wolf Creek between Helena and Great Falls. Town preserved by 'tight' design through narrow canyon."

Part 8

A Living Legacy

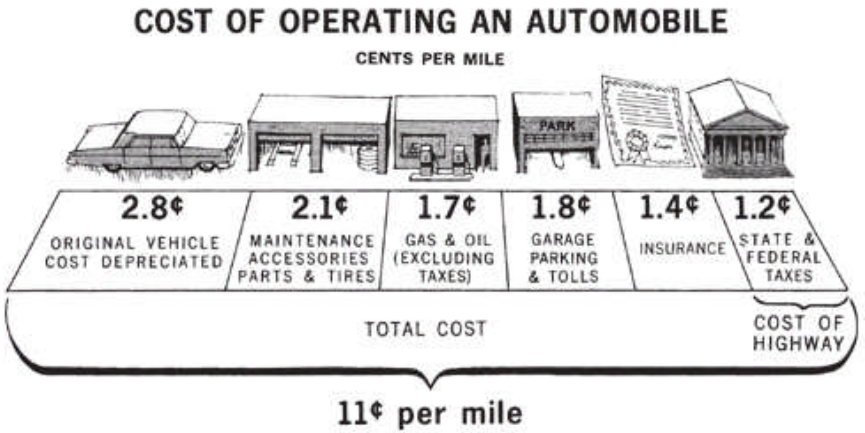
The Web of Union

"…the present structure makes it almost impossible to serve either the growing demands of this great Nation or the needs of the industry, or the right of the taxpayer to full efficiency and frugality…In a Nation that spans a continent, transportation is the web of union…the tenuous skein of rough trails and primitive roads of the Nation's early years have become a powerful network on which the prosperity and convenience of our society depend…America's history is a history of her transportation. We must face facts, it is no longer adequate…a day will come in America, when people and freight will move through this land of ours speedily, efficiently, safely, and dependably…coordinate a national transportation policy for this great land of ours, and give the kind of results that the American people would like to point to with pride…"

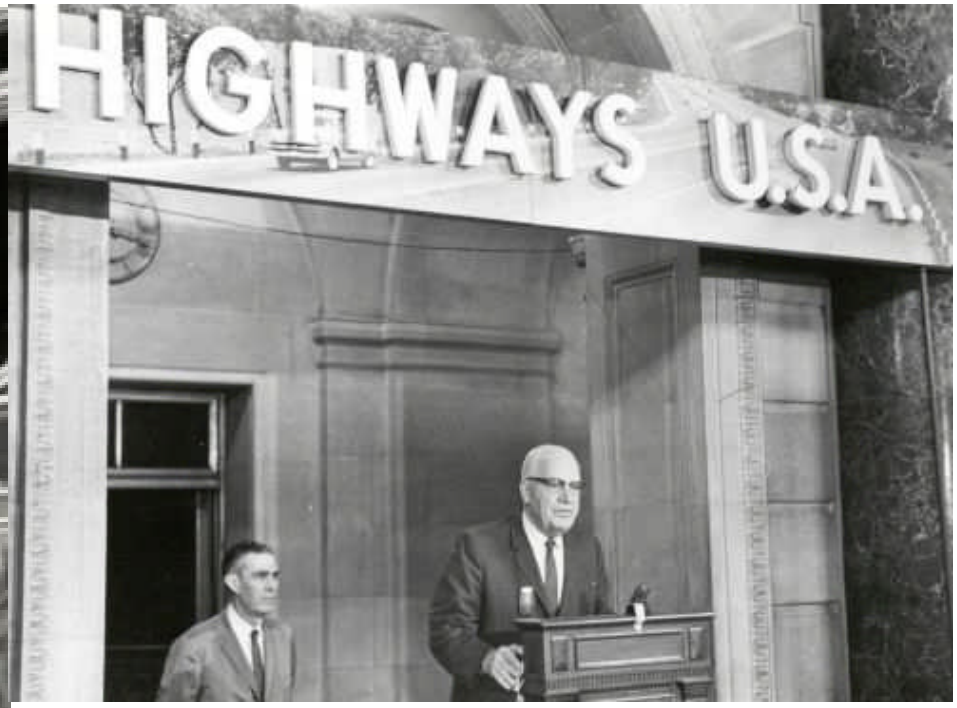
POTUS *Lyndon B. Johnson*

RE: in January 1966, President Johnson - in his *State of the Union* address, proclaimed the need for a a "U.S. Department of Transportation" (USDOT) considering the fact that thirty-five government agencies were spending $5 billion per year on transportation. On March 2nd 1966, he submitted the legislation to *Congress* to form the USDOT (of which BPR would be a part) urging its creation: *"to serve the growing demands of this great Nation, to satisfy the needs of our expanding industry, and to fulfill the right of our taxpayers to maximum efficiency and frugality in Government operations."* In October 1966, President Johnson signed the "U.S. Department of Transportation Act" in a formal ceremony at the *White House*. The new law brought together thirty-one agencies and bureaus. By far, BPR had the largest budget; $4.4 billion, in an agency with a total budget of $6.6 billion.

The First Fifty Years are the Easiest

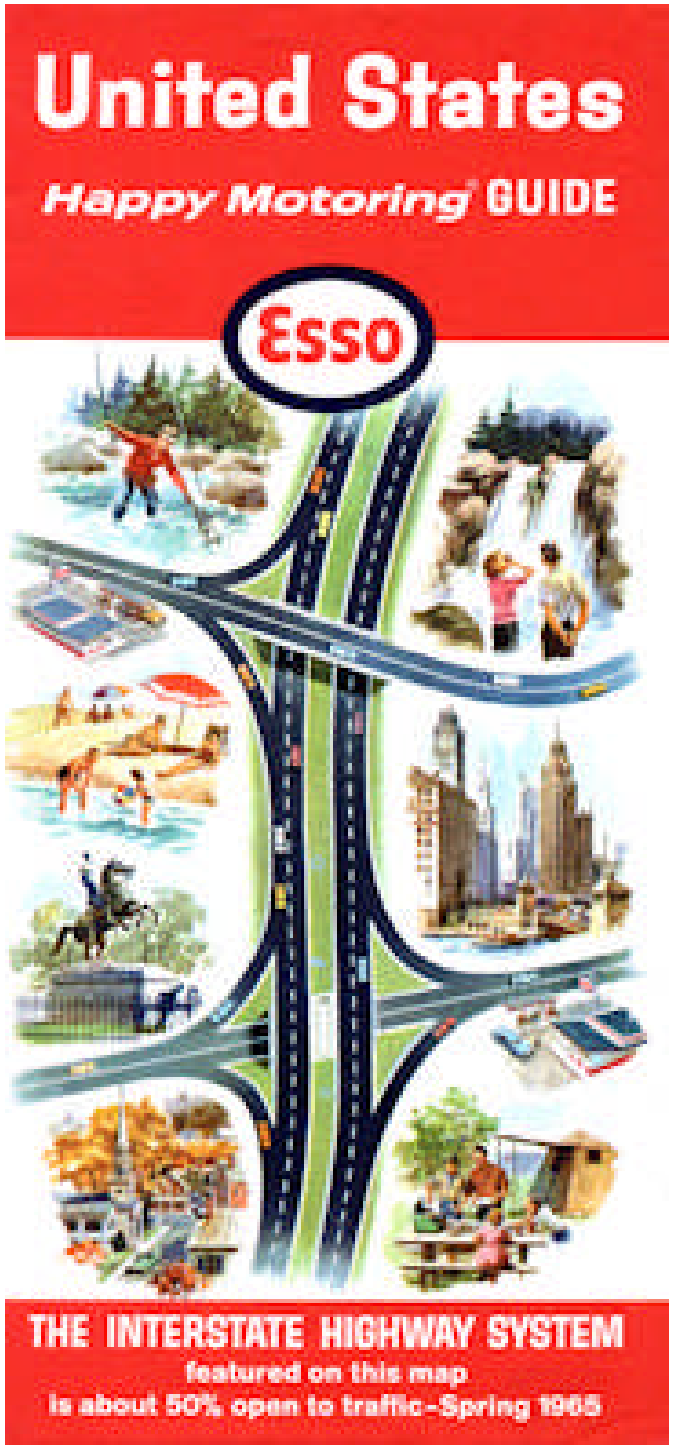


<u>Above</u>: caption: "BPR used this 1966 graphic to put the cost of highways in perspective and allay public displeasure. As BPR explained here, State and Federal highway taxes represented only 1.2 cents of the total 11 cents per mile it cost to own and operate an automobile back then. The figures were based on a $2,800 car driven 100,000 miles over 10 years." Initially, Whitton and the road-building community were convinced that social and environmental issues facing the highway program could be addressed with public relations initiatives such as the graphic above. In late 1966, BPR chief *Rex Whitton* left office. During his tenure as Federal Highway Administrator, he had successfully addressed the problems that faced the *National System of Interstate and Defense Highways.* By cooperating with the *Blatnik Committee* and strengthening BPR oversight, Whitton had helped put to rest the scandals that had cast a giant shadow over the agency he headed and gave fodder to its critics. As well, he *Federal-Aid Highway Act of 1961* placed the program on a sound financial footing that would carry it through to the early 1980's. During his final presentation to the AASHO in November 1966, Whitton told his peers: *"The first fifty years are the easiest…you ain't seen nothing yet."*



<u>Above</u>: caption: "Promotion of the Interstate System was a hallmark of Rex Whitton's tenure. Here he is seen with Commerce Secretary Luther H. Hodges opening 'Highways U.S.A.,' an exhibit in the Department of Commerce Building marking 5 years of Interstate construction (1956-1961)."

<u>Left</u>: caption: "On May 11, 1965, President Lyndon B. Johnson greets Administrator Rex Whitton at the start of Lady Bird Johnson's 2-day Landscapes and Landmarks Tour of I-95 in Virginia to promote highway beautification."



"…I have been around long enough to have confidence that our highway program is not frozen by tradition, that it has not only resiliency but also the flexibility needed to respond to any new challenge. And I have confidence that its response, that your response, that the response of the highway engineer, will be more than adequate to what our Nation expects and deserves - and that, gentlemen, is a lot."

***Rex Whitton*, Federal Highway Administrator**

RE: excerpt from his farewell speech (November 1966). In February 1966, BPR announced that the states had met Whitton's challenge to AASHO by opening more than half of the Interstate System. With the unveiling of 2,166 miles in 1965, open mileage totaled 21,185 miles, or 52% of the 41K-mile system. Construction was underway on another 5,580 miles. Only 2,880 miles, or 7% of the system had not yet advanced beyond preliminary status. Approximately $24.7 billion had been spent on the Interstate program up to that time.

The new USDOT opened for business on April 1st 1967. The opening of the new Department meant many changes for BPR. First and foremost concerned its very name. "Bureau of Public Roads" had been used during two periods of the agency's history spanning thirty-nine years ("Public Roads Administration" was the interim name given the agency). The agency now became the "Federal Highway Administration" (FHWA). The renamed agency was organized into bureaus headed by directors, with the BPR name retained for one of them, along with the "Bureau of Motor Carrier Safety" (now the "Federal Motor Carrier Safety Administration") and the "National Highway Safety Bureau" (now the "National Highway Traffic Safety Administration"). The agency increased from about 4,800 employees at the end of 1966 to 5,360 employees by the end of 1967. In August 1970, FHWA eliminated the bureau structure, replacing the directors with associate administrators and ending the use of the name *Bureau of Public Roads*.

"His national reputation as a pioneer of modern highway construction not only brings honor to his memory, but also to a profession he dearly loved."

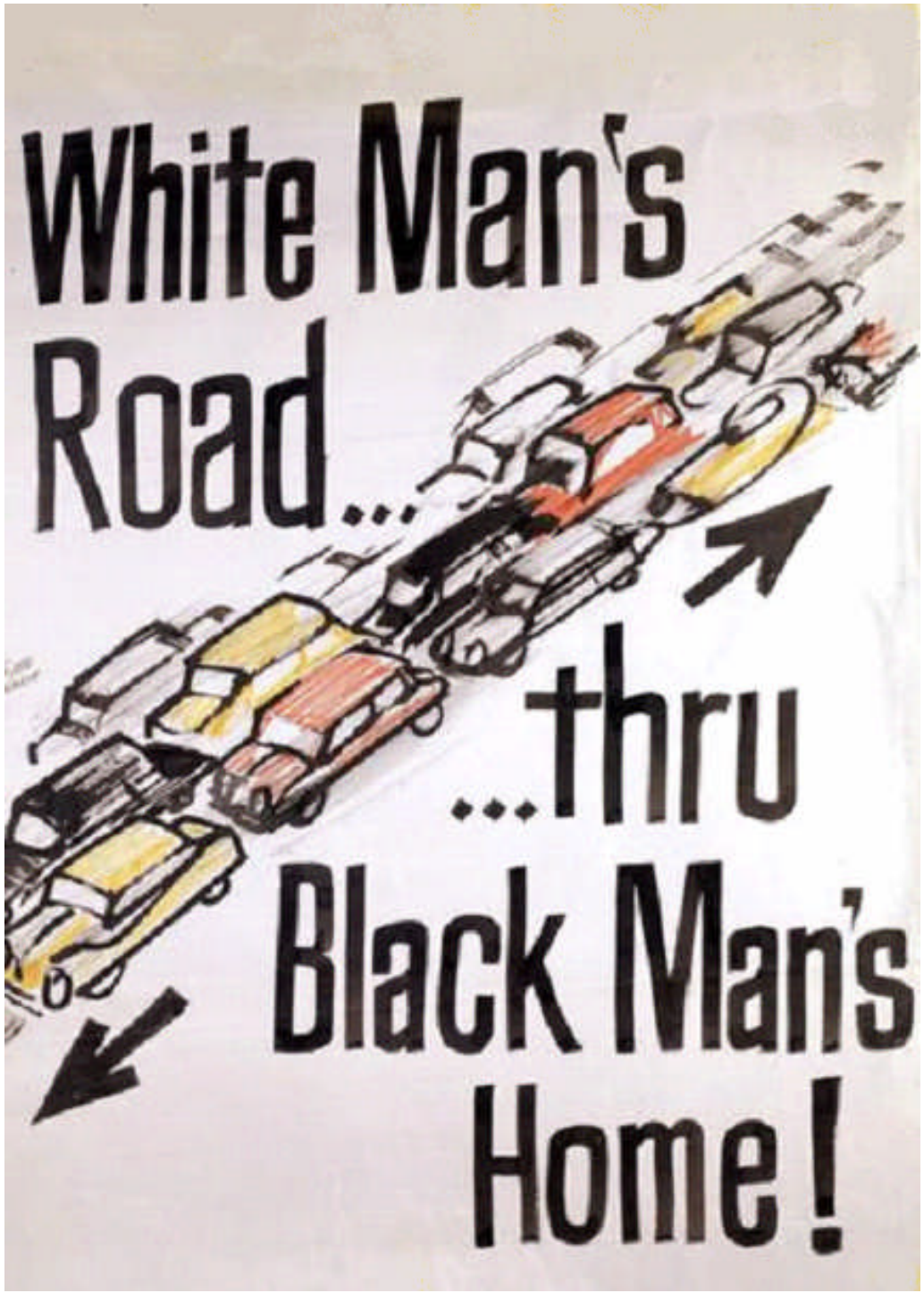
***AASHTO Quarterly,* July 1981**

RE: upon his retirement, Whitton went to work as a consultant to an engineering firm in *Kansas City, MO*. He retired in 1975. In 1976, he told *FHWA News* (the agency newsletter) that he and his wife enjoyed driving to auction sales for antiques. However, they avoided the freeways he had helped to build. He never liked driving on them, he said, and now enjoyed: *"driving on the little back roads, keeping a map of each one we travel."* Whitton passed away at the age of 82 on July 7th 1981.

Highways of Change

"…to facilitate the transition financing of the rehabilitation of blighted areas, to employ its powers of eminent domain in the public interest, and to fix the standards of re-development…radical revision of the city plan…"

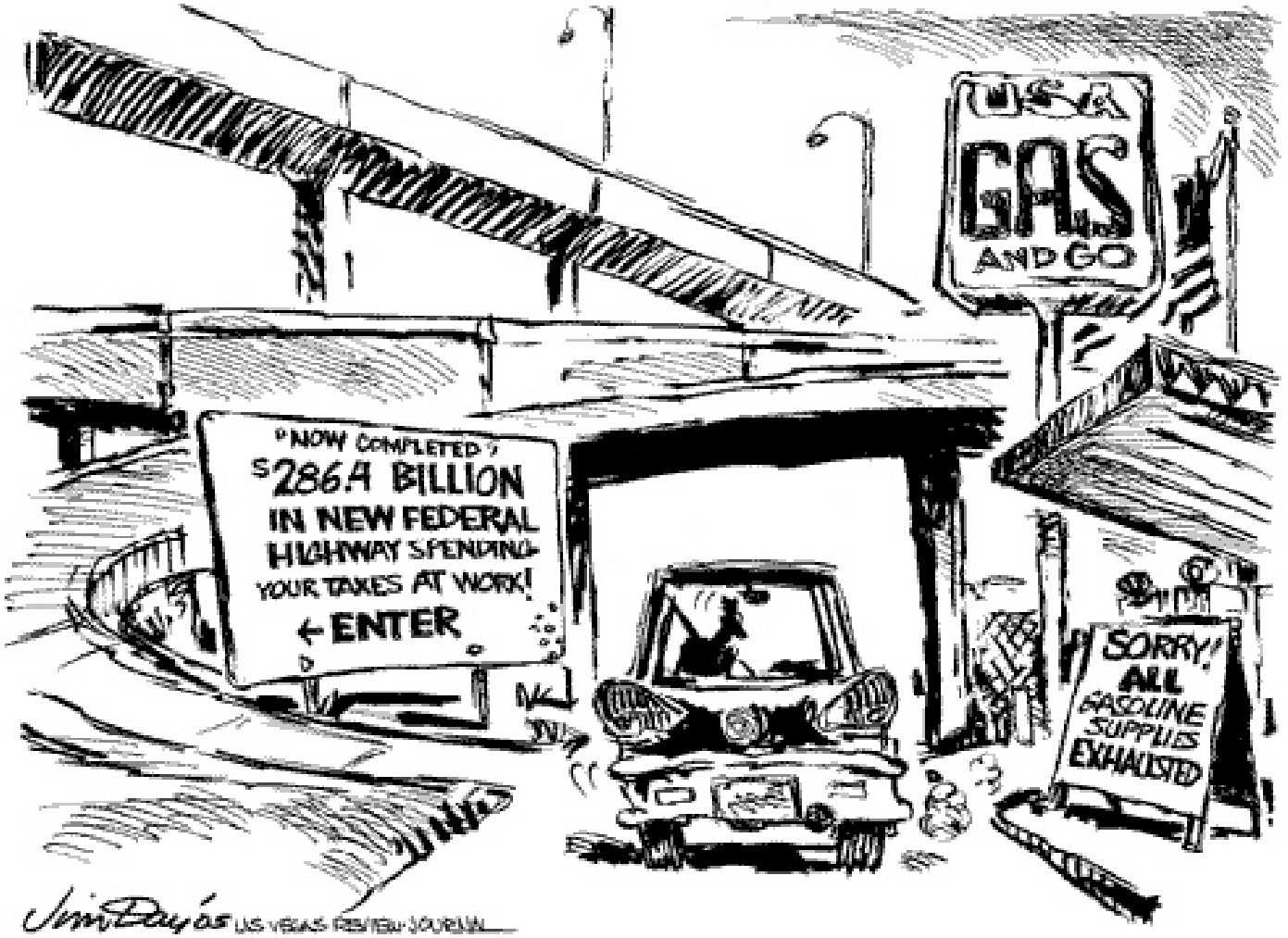
RE: excerpt from the *Interregional Highways* report, 1944. The period when the *Interstate Highway System* was conceived in two reports to *Congress*; *Toll Roads and Free Roads* (1939) and *Interregional Highways* (1944), was very different from the world facing the builders of the Interstate System in the 1950's and '60's. In accordance with the 1896 Supreme Court decision in *Plessy vs, Ferguson* that had rendered "separate but equal" facilities acceptable, public accommodations along the nation's roads throughout the South and adjacent states were racially separate. Elsewhere, de facto segregation was commonplace. Though LBJ would do much to ensure civil rights (i.e. *Civil Rights Act of 1964*), he had little effect on the Interstate System since the system had been planned long before the Civil Rights movement gained broad public and political acceptance.



The urban world of the 1939 *Toll Roads and Free Roads* report was one in which the automobile had encouraged the outward transfer of the homes of citizens and businesses to the suburbs. According to the report, urban homes were *"occupied by the humblest citizens"* who lived along the fringe of the business district – *"a blight near its very core!"* By the time President Eisenhower signed the Federal-Aid Highway Act of 1956, the Supreme Court's 1954 ruling in *Brown vs. Board of Education* had overturned *Plessy vs. Ferguson* and declared the broader segregation of American society un-constitutional. Some city officials welcomed slum-clearance projects as essential to their long-term economic viability. As Interstates began to run through blighted areas, the burgeoning Civil Rights movement was gaining momentum, giving the "humblest citizens" a voice. By the 1960's, the urban revitalization envisioned by the Interstate's visionaries was derided as building "White men's roads through black men's homes.'

Expansion

The "Federal-Aid Highway Act of 1968" authorized the Interstate Highway System's expansion to 42,500 miles. An amendment designated an additional two-hundred miles for modification or revision of the basic system. Section 16 of the 1968 Act provided that the USDOT Secretary may designate, as part of the Interstate System, a highway meeting all standards for Interstate highways and that are logical additions or connections to the System. The "Federal-Aid Highway Act of 1973" increased this to five-hundred miles. The "Surface Transportation Assistance Act of 1978" provided full Interstate construction funding for all routes designated under previous system adjustments. Another provision of this Act prohibited use of Interstate construction funds for the construction of any new miles designated after passage of this Act. A section of the "National Highway System Designation Act of 1995" (NHSDA) amended a section of the "Inter-modal Surface Transportation Efficiency Act of 1991" (ISTEA) to designate four high priority corridors as future Interstate routes when the USDOT Secretary determines that they meet Interstate design standards and connect to an existing Interstate route. The NHSDA created no Federal financial responsibility for these Interstate additions. A section of the "Transportation Equity Act for the 21st Century" modified the description for three of these corridors and designated five additional corridors as future parts of the Interstate System. Except for a few miles of added lane projects which were included in and approved as part of the 1991 ICE, Interstate construction funds may not be used for adding lanes to existing Interstate routes. However, states may use other appropriate classes of Federal-aid funds to add additional capacity to the Interstate System.


USA
GAS
AND GO
"NOW COMPLETED"
$286.4 BILLION
IN NEW FEDERAL
HIGHWAY SPENDING
YOUR TAXES AT WORK!
←ENTER
SORRY!
ALL
GASOLINE
SUPPLIES
EXHAUSTED
Jim Davis LAS VEGAS REVIEW-JOURNAL

Sunbelt Shift

The first decade of Interstate construction was the most intense period of road building in history. Half of the designated Interstate System was open by the end of 1966. By the 1970's, enough Interstate roadway was on the ground that the changes President Eisenhower had predicted began to occur. By the 1980's the Interstate system was essentially complete with Interstate motorists facing few gaps. One of the more dramatic changes since the 1950's involves the geographic distribution of population. There has been a pronounced "sunbelt shift" of population, with over 90% of national growth in the 1980's going to the South and West, at the expense of the older, more settled regions of the Midwest and Northeast. The South and West now have more than half of the nation's population. Furthermore:

- **Since 1950, metropolitan areas have grown from 56% of national population to 80%;**
- **All of the growth in metropolitan areas in the 1980's occurred in suburban areas, as central cities declined in population;**
- **Metropolitan areas were roughly 50% suburban and 50% urban in 1950; now that ratio is closer to two-thirds suburban and rising;**
- **Metropolitan areas are losing population to non-metropolitan areas, often to those rural areas on the fringes of metropolitan complexes;**
- **More than half of national growth continues to be in three states; *California, Texas*, and *Florida***

It was/is the Interstate System that has helped these states accommodate the population influx.

All but four state capitals are directly served by the *Interstate Highway System*. Those not directly served are: *Juneau, AK* / *Dover, DE* / *Jefferson City, MO* / *Pierre, SD*. The oldest Interstate segments actually predate the establishment of the Interstate system. Early examples include a portion of the *Grand Central Parkway* in *Queens, New York City*, which was opened to traffic in July 1936 and later was incorporated into the Interstate System as I-278. The *Pennsylvania Turnpike* between *Irwin* (southeast of *Pittsburgh*) and *Carlisle* (west of *Harrisburg*) was officially opened in October 1940 but was used by the *U.S. Army* even before its official opening (see photo at right) and is now designated as I-76 and I-70. Other freeways and toll roads were incorporated into the Interstate System rather than build new, competing Interstate routes.

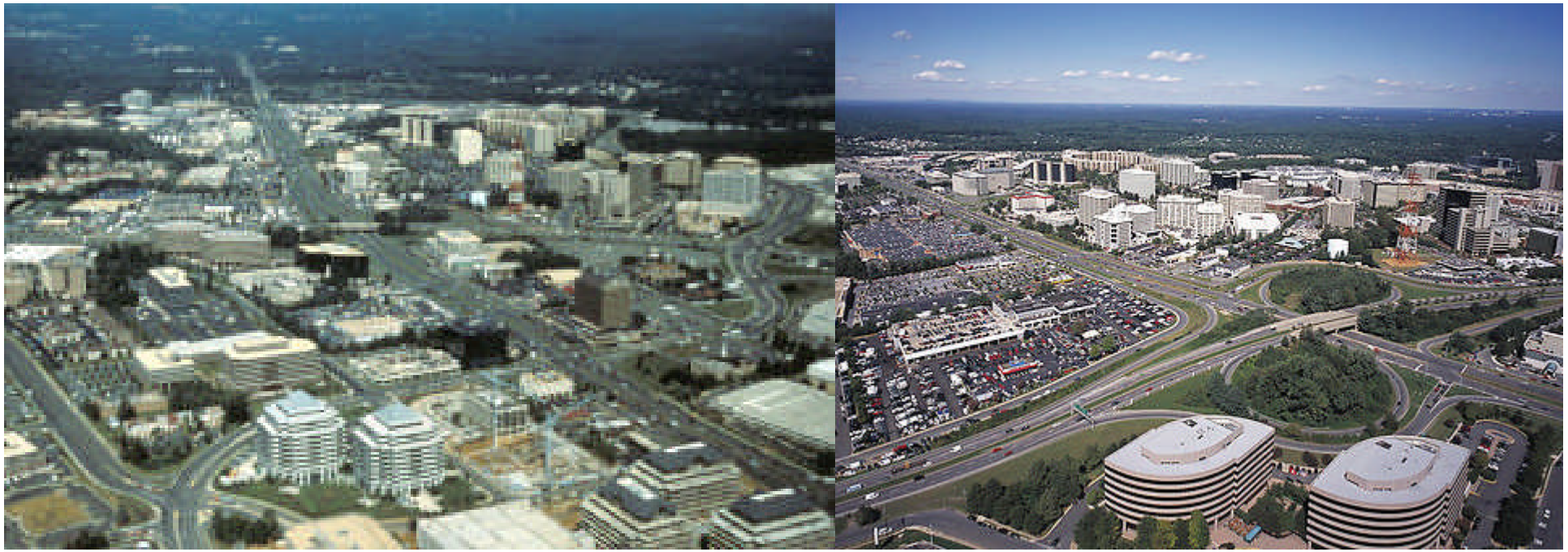
Left: caption: "The *New York City Building* of the 1939/40 New York World's fair under construction ca. 1938 (Grand Central Parkway in foreground)."

Right: caption: "When it opened on Oct. 1, 1940, the Pennsylvania Turnpike gave American motorists their first chance to experience what someday would be known as an 'interstate.' Pennsylvania calls the turnpike 'The Granddaddy of the Pikes.'"

The Four R’s

Completion of the $129-billion designated mileage (42,793 miles) in the Interstate System was a cooperative Federal-State undertaking. Each State transportation department managed its own Interstate program for location, design, right-of-way acquisition and construction of the designated mileage. The FHWA's role was one of oversight, review and approval of the projects to ensure compliance with Federal requirements. Ownership of the Interstate routes and the responsibility for their perpetual operation and maintenance was/is the responsibility of each state. Initially, all Interstate maintenance responsibility was placed on the states. However, as the system aged, a separate federally funded program was enacted in 1976 called the Interstate "3R Program" (Resurfacing, Restoration & Rehabilitation). In 1981, the Interstate 3R program was expanded to a "4R Program" (with the addition of Reconstruction as an eligible item).

Cities on the Edge



"...are tied together not by locomotives and subways, but by jetways, freeways, and rooftop satellite dishes thirty feet across."

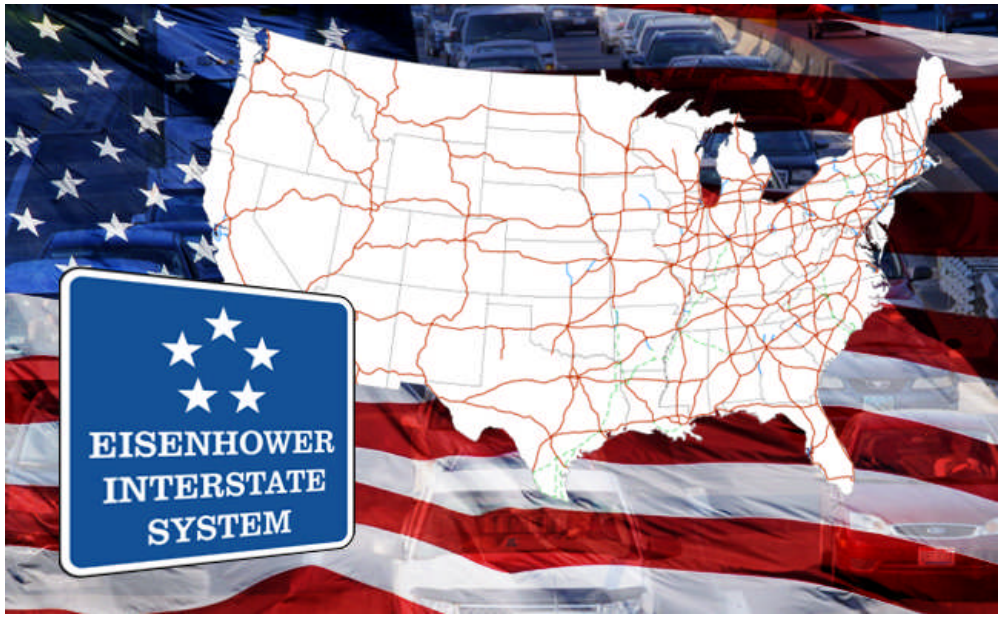
RE: excerpt from: "Edge City: Life on the New Frontier." According to the author, an "Edge City" is any place that has five million square feet or more of office space, 600K square feet or more of retail space and has more jobs than bedrooms. They are a direct by-product of the *Eisenhower Interstate Highway System.* Though they vary from one location to another, Edge Cities thrive on interstate highways and typically contain a mix of offices, shopping malls, corporate headquarters, hotels and entertainment. They are not the product of urban planners who can, at best, try to predict human behavior, but of savvy developers who know what people want. The force that drove the creation of the Edge City was a search for a balance of individualism and freedom. Collectively, we Americans wanted to build a world in which we could live in one place, work in another and play in a third. This demanded transportation that would allow us to go where we wanted, when we wanted. Thus was enshrined on the American psyche the individual transportation system; the automobile, in our daily lives. As such, the Edge City was a natural extension of the Interstate System.

<u>Above L&R</u>: *Tysons Corner* in *Fairfax County, Va*., just off I-495, the *Capital Beltway* around metropolitan *Washington, D.C.,* is a classic example of an Edge City

<u>Above</u>: caption: "Oregon - Interchanges along the freeway have led to industrial and community development. This shows a development adjacent to the Albany Interchange along Interstate 5 in Oregon."

<u>Left</u>: caption: "Oregon - A connecting link from Interstate Route 5 (on the right) joins Harbor Drive at the edge of downtown Portland. An area prepared for urban re-development appears at the upper left."

Freedom of the Road



"…Like the other freedoms we celebrate as Americans, the freedom of mobility is exercised daily and regarded as our national birthright. We often forget that it is not so in other lands. In most countries throughout the world today, we know that freedom of movement of people is severely restricted by a variety of 'roadblocks,' both literal and figurative. In the Soviet Union, for example, a citizen must apply for a visa to get permission to travel between certain cities and areas within that country. But in the United States, it is a significant measure of the 'liberty' we celebrated this Fourth of July that a citizen can drive to Boston or Houston or Los Angeles at any time he chooses without encountering so much as a traffic light or stop sign. Our Constitution and laws have made it legal - for which we will forever count our blessing; but it is our Interstate highways that have made it possible."

***Ray A. Barnhart,* Federal Highway Administrator**

RE: excerpt from an article Barnhart authored on the occasion of the 30th Anniversary of the *Interstate Highway System* (appearing in the Fall 1986 issue of *U.S. Highways*)

NOW, THEREFORE, I, RONALD REAGAN, President of the United States of America, do hereby proclaim June 26, 1986, as National Interstate Highway Day, and I call upon the people of the United States to observe that day with appropriate ceremonies and activities.

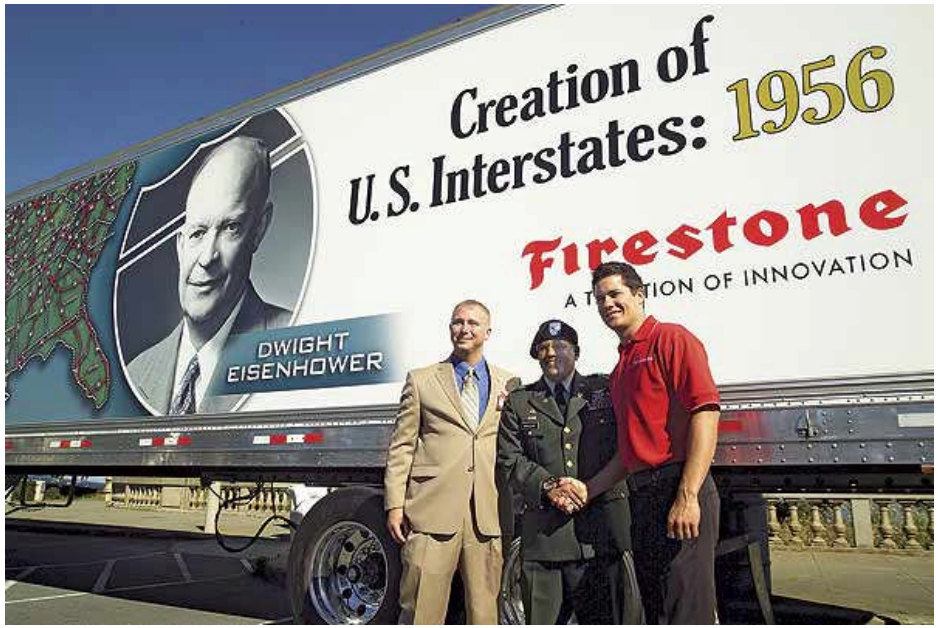
IN WITNESS WHEREOF, I have hereunto set my hand this nineteenth day of June, in the year of our Lord nineteen hundred and eighty-six, and of the Independence of the United States of America the two hundred and tenth.

"There are few governmental projects that have played a more important or dramatic role in the development of this country. Today we have an unparalleled system that is 97 percent complete with 41,297 miles open to the public. America is, in fact, mobility, and the Interstate system is the backbone of that mobility…The Interstate system links more than 90 percent of America's cities with populations of 50,000 or more, and many smaller towns as well. Its importance to industry, commerce, the economy and recreation and travel cannot be overstated… The system is a tremendous engineering achievement that maintains the economic growth of America. The 30th Anniversary of this peerless system is the time for all members of the highway community to be recognized for their contributions to the development and maintenance of our Interstate highways."

***Ray A. Barnhart,* Federal Highway Administrator**

RE: in a formal proclamation, POTUS *Ronald Reagan* designated June 26th 1986 as "National Interstate Highway Day," calling the American system of highways: *"the world's largest and most successful transportation and public works project."* In his speech, Barnhart cited the fact that in 1985 alone, 325 billion miles had been traveled on the Interstates and he pointed out that although the system comprises little more than 1% of the nation's total road mileage, it carries 20% of the nation's highway traffic. On August 22nd 1986, a milestone in America's Interstate history was reached when the final section of I-80; the east-west trans-continental Interstate, was completed near *Salt Lake City, Utah*. The completion of the final 4.5 miles of I-80 marked the completion of the longest freeway in the world, running 2,908 miles from the *George Washington Bridge* in *New York City* to the *Oakland Bay Bridge* in *San Francisco*. By the time of the 30th Anniversary, the system was composed of more than 40K miles of divided highways, built by nearly 2.4 billion man-hours of time. Each year, approximately 352 billion miles were traveled on the system with a safety record of 1.06 fatal accidents per 100 million miles traveled; less than half that tallied on the nation's other highways.

Birthday Party on Wheels



"Federal, state and local officials gathered at San Francisco's Lincoln Park on a bright morning in mid-June to celebrate the 50th anniversary of the birth of the Interstate Highway System. The scenic site has an important place in U.S. transportation history, as the endpoint for the 1919 First Transcontinental Motor Train. The arduous 62-day, 3,250-mile journey by several dozen military vehicles from Washington, D.C., to San Francisco helped forge the vision for a network of modern, uniform highways linking the country from coast to coast. At the ceremony this June, Lincoln Park again made history, this time as the starting point for a motorcade destined to retrace the route of the 1919 Motor Train, albeit in reverse, and at a speedier pace. A highlight of the anniversary convoy was a big rig emblazoned with a portrait of Dwight D. Eisenhower, who not only participated in the First Transcontinental Motor Train as a young Army lieutenant colonel, but also — as the nation's 34th president — signed the bill authorizing the National System of Interstate Highways in 1956. 'This act did more to bring Americans together than almost any other law of the last century,' U.S. Secretary of Transportation Norman Mineta told the crowd."

Metropolitan Transportation Commission **(Oakland, CA)**

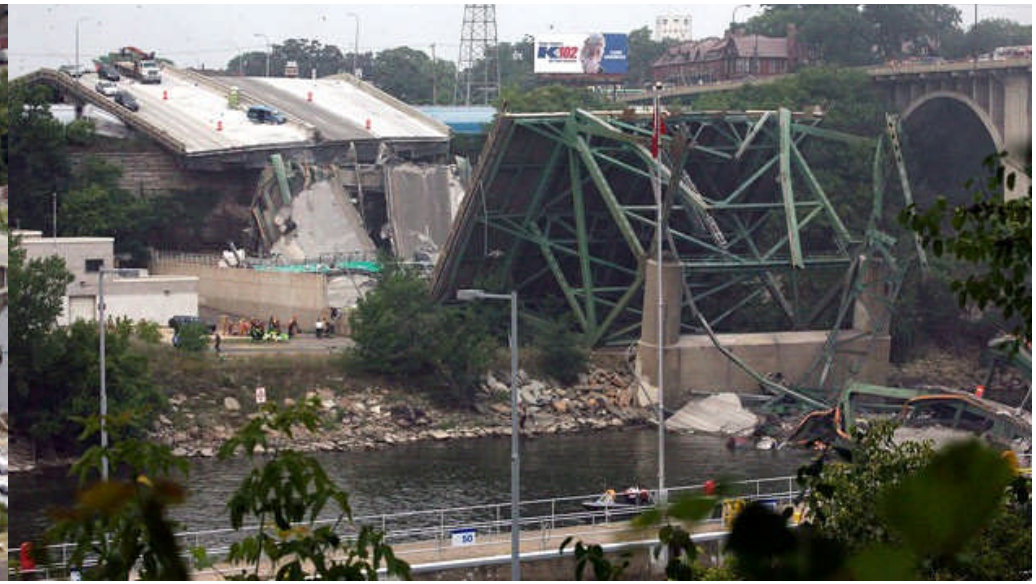
RE: excerpt from their July/August 2006 newsletter.

<u>Above</u>: caption: "Posing in front of the truck are descendants of two people considered "fathers" of the Interstate Highway System: Merrill Eisenhower Atwater (left), great-grandson of Dwight D. Eisenhower, and Andrew Firestone (right), great-grandson of Harvey Firestone, founder of Firestone Tire & Rubber Company. Representing the military, which also played a role in conceiving the Interstate System, is U.S. Army Colonel David McClean (middle)."

The I-35 Corridor

"The I-35 Corridor's multimodal transportation hubs – where air, rail, river, and truck cargo converge – make I-35 ideally positioned to be a major route for what is expected to be increasing levels of international trade activity…Over the next few decades, about 65 percent of I-35 will require major upgrades, however the entire route will have a continued need for rehabilitating pavements, resurfacing sections of the highway, and providing replacements of some bridge decks. Bridge substructures and superstructures will also need to be maintained, requiring repairs to maintain the integrity of the bridges."

RE: excerpt from a 1998 *Federal Highway Administration* report warning that increased truck traffic was expected to create a safety concern with bridges in states along the proposed I-35 NAFTA Superhighway, including *Minnesota*. The FHWA study was conducted in conjunction with the Departments of Transportation/s in *Texas, Oklahoma, Kansas, Missouri, Iowa* and Minnesota, and assessed I-35 from *Laredo, Texas*, to *Duluth, MN*. A comprehensive study of freight traffic conducted by the FHWA, concluded that a large percentage of the freight carried through Minnesota is carried by truck. According to the FHWA data, a total of 280.7 million tons of freight moved through Minnesota in 1998, 86% by truck. Dramatic increases are projected, with freight traffic through Minnesota expected to double by 2035, to a total of 551.5 million tons per annum, of which 88% will be carried by truck.



"…About 6:05 p.m. Central Daylight Time on Wednesday, August 1, 2007, the eight-lane, 1,907-foot-long I-35W highway bridge over the Mississippi River in Minneapolis, Minnesota, experienced a catastrophic failure in the main span of the deck truss. As a result, 1,000 feet of the deck truss collapsed, with about 456 feet of the main span falling 108 feet into the 15-foot-deep river. A total of 111 vehicles were on the portion of the bridge that collapsed. Of these, 17 were recovered from the water. As a result of the bridge collapse, 13 people died, and 145 people were injured…"

NTSB Press Release, November 14th 2008

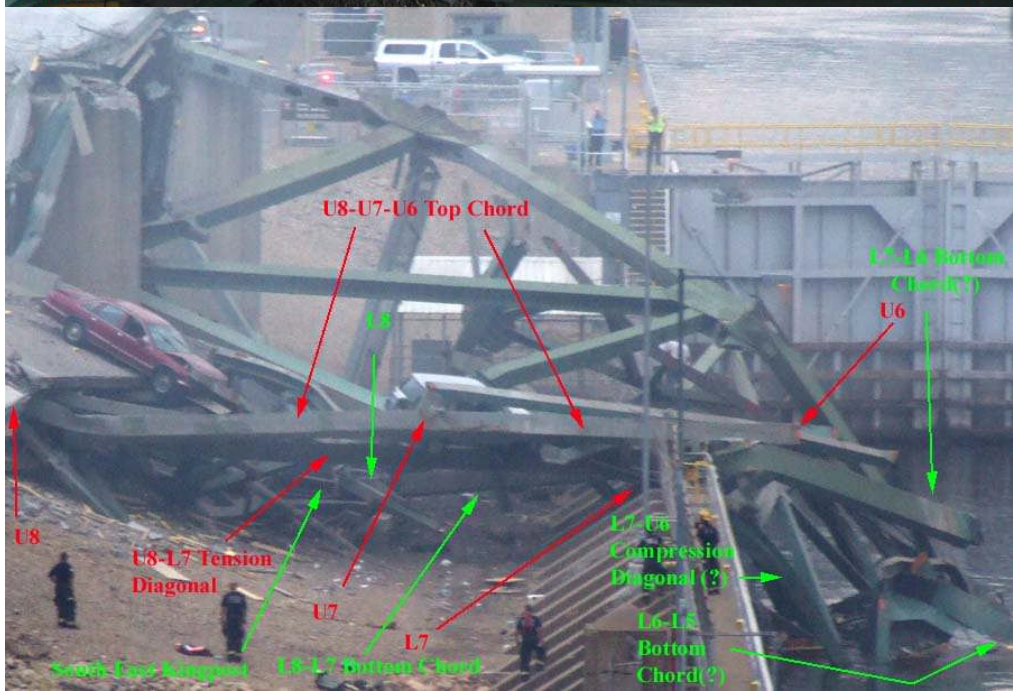
"The National Transportation Safety Board has determined the probable cause of the collapse of the I-35W bridge in Minneapolis, Minnesota, was the inadequate load capacity, due to a design error by Sverdrup & Parcel and Associates, Inc., of the gusset plates at the U10 nodes, which failed under a combination of (1) substantial increases in the weight of the bridge, which resulted from previous modifications, and (2) the traffic and concentrated construction loads on the bridge on the day of the accident. Contributing to the design error was the failure of Sverdrup & Parcel's quality control procedures to ensure that the appropriate main truss gusset plate calculations were performed for the I-35W bridge and the inadequate design review by federal and state transportation officials. Also contributing was the generally accepted practice among Federal and State transportation officials of giving inadequate attention to gusset plates during inspections for conditions of distortion, such as bowing, and of excluding gusset plates in load rating analysis…During its investigation, the Safety Board learned that 24 under-designed gusset plates, which were about half the thickness of properly sized gusset plates, escaped discovery in the original review process and were incorporated into the design and construction of the bridge…"

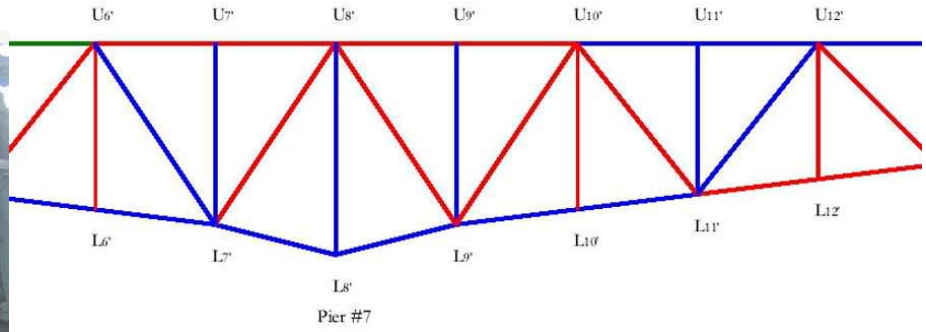
NTSB Press Release, November 14th 2008

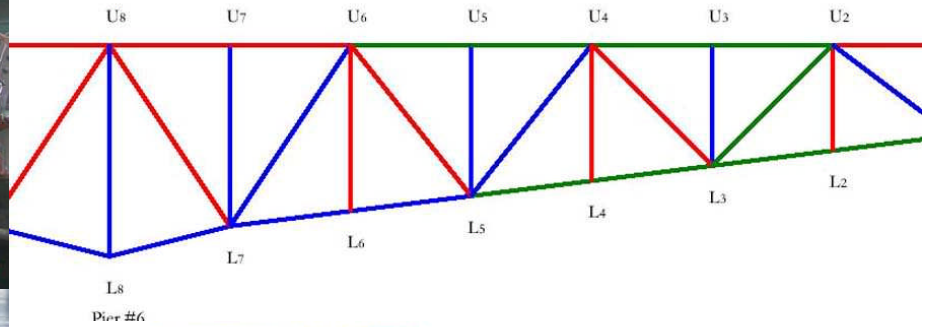
"…On the day of the collapse, roadwork was underway on the I-35W bridge, and four of the eight travel lanes (two outside lanes northbound and two inside lanes southbound) were closed to traffic. In the early afternoon, construction equipment and construction aggregates (sand and gravel for making concrete) were delivered and positioned in the two closed inside southbound lanes. The equipment and aggregates, which were being staged for a concrete pour of the southbound lanes that was to begin about 7 p.m., were positioned toward the south end of the center section of the deck truss portion of the bridge near node U10 and were in place by about 2:30 p.m. Shortly after 6 p.m. a lateral instability at the upper end of the L9/U10W diagonal member led to the subsequent failure of the U10 node gusset plates on the center portion of the deck truss. Because the deck truss portion of the I-35W bridge was considered non-load-path-redundant, the total collapse of the deck truss was unavoidable once the gusset plates at the U10 nodes failed…"

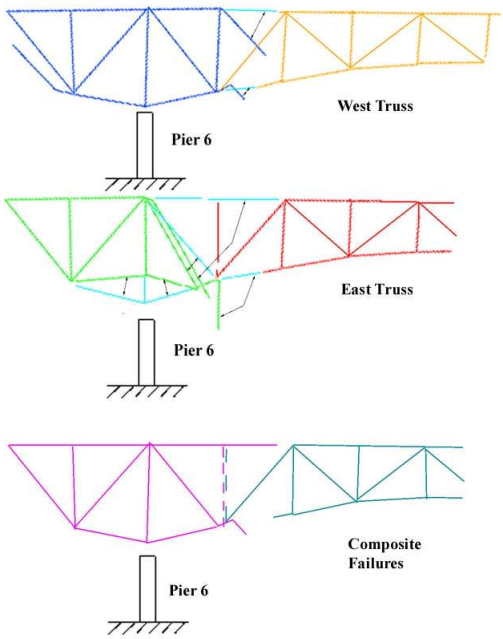
NTSB Press Release, November 14th 2008


South East Pier 6
Kingpost
North Face
U8 Gusset
U7 Floor
Truss Gusset
Top Face
Top Chord Tension Member U8-L7
East Face
West Face
Diagonal Tension Member U8-L7
North Face


U8-U7-U6 Top Chord
L8
U6
U8
U8-L7 Tension
Diagonal
U7
L7
L7-U6
Compression
Diagonal (?)
L6-L5
Bottom
Chord(?)
South East Kingpost
L8-L7 Bottom Chord


U6'
U7'
U8'
U9'
U10'
U11'
U12'
L6'
L7'
L8'
L9'
L10'
L11'
L12'
Pier #7


U8
U7
U6
U5
U4
U3
U2
L7
L6
L5
L4
L3
L2
L8

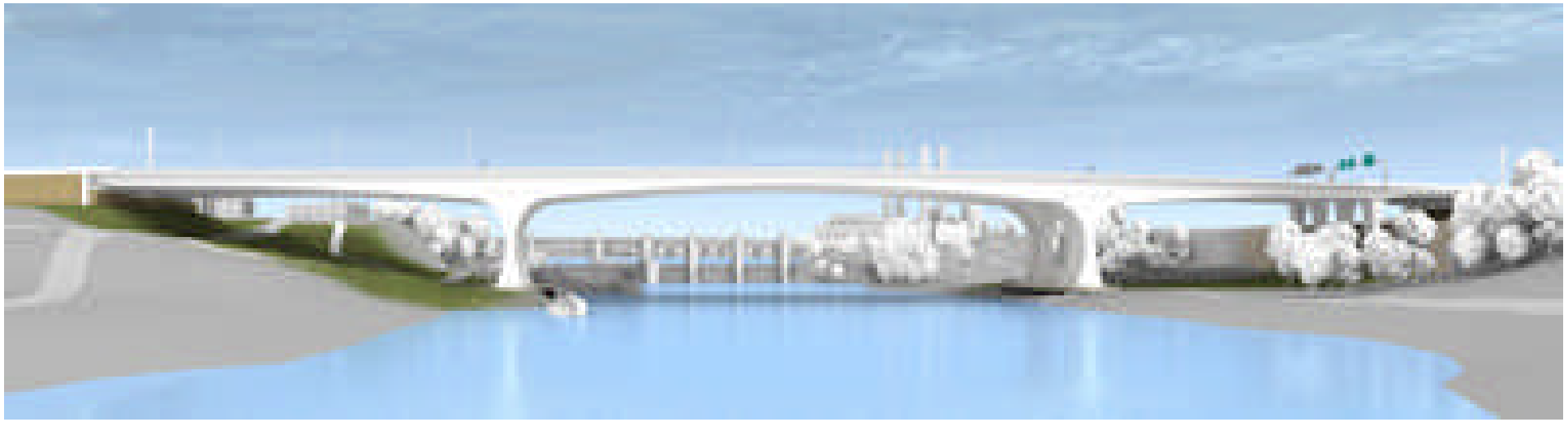

West Truss
Pier 6
East Truss
Pier 6
Composite
Failures
Pier 6

NTSB
National Transportation Safety Board

"We believe this thorough investigation should put to rest any speculation as to the root cause of this terrible accident and provide a roadmap for improvements to prevent future tragedies. We came to this conclusion only through exhaustive efforts to eliminate each potential area that might have caused or contributed to this accident…Bridge designers, builders, owners, and inspectors will never look at gusset plates quite the same again, and as a result, these critical connections in a bridge will receive the attention they deserve in the design process, in future inspections, and when bridge load rating analyses are performed. By addressing all three areas in our recommendations, we are hopeful that industry and government bodies will take appropriate action and the American people can continue to have confidence in the safety of our nation's bridges."

NTSB Acting Chairman *Mark V. Rosenker*, November 2008

RE: as a result of its extensive investigation, the NTSB made nine recommendations to the *Federal Highway Administration* and the *American Association of State Highway and Transportation Officials* dealing with improving bridge design review procedures, bridge inspection procedures, bridge inspection, training and load rating evaluations



"The new I-35W bridge replaced the bridge that collapsed on Aug.1 2007. This bridge carried more than 140,000 vehicles a day, and the loss of the bridge cost $400,000 per day in lost revenue. Without the bridge, the burden on surrounding roads - as well as the inconvenience to commuters - was significant. The new bridge features:

- ***100-year life span;***
- ***10 lanes of traffic, five in each direction - two lanes wider than the former bridge;***
- ***189-feet wide - the previous bridge was 113-feet wide;***
- ***13-feet wide right shoulders and 14-feet wide left shoulders - the previous bridge had no shoulders;***
- ***Light Rail Transport-ready which may help accommodate future transportation needs;***
- ***Design-build project completed in 339 days;***
- ***Designed to be aesthetically pleasing and fit in with its environment***

Minnesota Department of Transportation

RE: the new I-35W Bridge opened to traffic on Sept. 18th 2008, 3 months ahead of schedule

Borrowed Time

While the economic and social benefits realized during the first decades of the Interstate Highway System are demonstrable, the enormous load of automobiles, trucks, buses and commercial vehicles has taken its toll on the Interstates. The collapse of the I-35 in bridge in *Minneapolis* in August 2007 is a sad testament to that fact. Despite the important role played by the Interstates in the nation's economy and quality of life, the system requires renewed investment. Many portions of the *Interstate Highway System* (IHS) are strained to capacity, increasing delays and air pollution and dampening economic activity. The Interstate Highways were built to accommodate twenty years of traffic growth. By 1985, half of the system had reached its design life and, by 1995, 90% of the system was twenty years old or older. The original IHS, authorized when the nation's population was less than 170 million, is not much more extensive today as the nation's population exceeds 300 million. Here are some of the facts:

• From 1982 to 1992, urban traffic congestion increased by more than 15%;

• The percentage of urban interstate lane miles operating at above 80% of capacity at peak hour has nearly doubled since 1975;

• Rural interstate congestion, though minimal compared to that of urban areas, continues to grow;

• In 1995, 6% of interstate bridges were deemed structurally deficient by the USDOT. which can result in catastrophic bridge failure and loss of life. Besides the I-35 collapse in 2007, the collapse of the *Mianus River Bridge* on I-95 in *Connecticut* (1983) and *the Schoharie Creek Bridge* on I-95 in *New York* (1987) claimed thirteen lives;

• In 1996, USDOT determined that approximately 60% of interstate pavements were rated from fair to poor

<u>Above L&R</u>: The *Mianus River Bridge* collapse on June 28th 1983 resulted from a hangar pin connection failure due to excessive corrosion accumulation. A 100-foot-long suspended span (between piers 20 and 21 of the eastbound traffic lanes of the I-95 highway bridge over the *Mianus River* in *Greenwich, CT*) collapsed and fell 70-feet into the river below. Two tractor-semi trailers and two automobiles plunged into the void and were destroyed by impact from the fall. Three vehicle occupants died and three received serious injuries. It emphasized the need for specialized bridge inspection equipment and diligent maintenance programs.

The suspended span which collapsed was attached to the bridge structure at each of its four corners. To support the weight of the northeast and southeast corners of the suspended span, each corner was attached to the girders of the cantilever arm of an adjacent anchor span by a pin and hanger assembly. The pin and hanger assembly included an upper pin attached through the 2.5-inch thick web of the girder of the cantilever arm and a lower pin attached through the 2.5-inch thick web of the girder of the suspended span. One and one half inch thick steel hangers connected the upper and lower pins, one on the inside and one on the outside of the web. Sometime before the collapse of the suspended span, the inside hanger in the southeast corner of the span came off of the inside end of the lower pin. This action shifted the entire weight of the southeast corner of the span onto the outside hanger. The outside hanger gradually worked its way farther outward on the pin and, over a period of time, a fatigue crack developed in the top outside end of the upper pin (above). The shoulder of the pin fractured off, the pin and hanger assembly failed, and the span collapsed into the river (left).

The *Hatchie River Bridge* failure (top) in *Covington, TN*, in April 1989 and the *Schoharie Creek Bridge* collapse (middle) in *New York* in April 1987 pointed to the need to better understand and design for scour effects on bridge piers and abutments. These two failures caused an acceleration of research on scouring of bridge piers/abutments. The collapse of an upper deck span of the *San Francisco-Oakland Bay Bridge* (bottom) as a result of the *Loma Prieta* earthquake on October 17th 1989, accelerated research into the vulnerability of the nation's highways and bridges to seismic disturbances.

A 1993 report prepared by the Secretary of Transportation to *Congress* on the status of the nation's bridges concluded that, although bridge conditions were improving slightly, approximately 35% of the bridges in the *United States* were classified as deficient; either structurally deficient (21%) or functionally obsolete (14%). This compares to 37%, 21%, and 16%, respectively per a 1991 report. Structural deficiency does not necessarily imply that a bridge is unsafe. However, it does mean that a structure is unable to carry the vehicle loads or tolerate the speeds that would normally be expected for that particular bridge in its designated system. Functional obsolescence means that the bridge has inadequate width or vertical clearance for its associated highway system. In some cases, bridges become functionally obsolete because of highway improvements on the approaches to the bridge, such as lane additions or widening of approaching roads. In other cases, a bridge may be classified as functionally obsolete through a redefinition of desired standards.

Left: caption: "Advanced composites will be used to extend the service life of existing construction and to provide durability of new construction. Shown here is the column strengthening of a column on the Santa Monica Freeway in Los Angeles. This technology uses carbon toes that are wound around the column to increase seismic resistance."

The Road More Traveled

In the early stages of interstate planning, proposed programs omitted cities from the system, limiting the role of the Interstates to intercity transportation. The urban Interstates were added to the system at the insistence of urban interests. Though problematic, the IHS provides critical mobility in urban areas expediting urban trips for automobiles, buses and trucks while reducing traffic congestion on non-Interstate arterial roads and highways. According to the 1994 *Highway Statistics and National Transit Database,* even bustling *New York City*, which relies on rail transportation to a far greater extent than any other U.S. metropolitan area, the interstate highway market share (measured in "person trips") is nearly double that of the region's sprawling rail system. In other urban areas, the *Interstate Highway System* is even more important, with interstate market share exceeding that of rail transit by more than thirty times. The database found that among the thirty largest urbanized areas outside NYC, interstate highways carry from 7 to 10 times the person miles of non-highway modes (mainly rail) in three urban areas; *Boston, Chicago* and *Philadelphia*; from 10 to 50 times as many person miles in four urban areas: *San Francisco-San Jose, Washington-Baltimore, Atlanta* and *Miami-Fort Lauderdale*; and from 50 to 150 times in eight urban areas; *Buffalo, Cleveland, Pittsburgh, Portland, St. Louis, San Diego, New Orleans* and *Sacramento*. In the remaining urban areas, non-highway market share is negligible in comparison with that of the urban interstate highways.

Each lane of urban Interstate is capable of moving between 2,500 and 4K persons per hour. This huge volume of traffic qualifies Interstates as among the most effective urban mass transportation systems. The average urban Interstate lane carries more people on a daily basis than the most successful of the nation's light rail systems and many Interstate lanes carry more people than rail lines during thei peak travel hours, according to studies done ion the 1990's. Interstates are capable of carr ng far more people where they include "High-Occupancy Vehicle" (HOV) lanes that expeuite trips for buses and car pools. The most successful HOV lane carries up to seven times the volume of general purpose lanes and more people during peak hours than any of the nation's urban rail lines (outside *New York City*). Interstate HOV lanes provide a form of mass transportation which allows for efficient access to an entire metropolitan region, not just the downtown markets to which efficient mass transit services are typically limited. This vastly increases potential destinations in the mass transportation market beyond the downtown areas which comprise, on average, only one-tenth to one-thirtieth of employment in urban areas. Urban residents use the Interstates primarily because of the time that they save. In urban corridors, time savings of up to 60% have been observed.

The urban Interstates are the high capacity component of what has developed as the world's most democratic, extensive, highly used, inexpensive, and flexible system of urban mass transportation - the urban highway system. While traffic congestion is increasing, the urban interstate highway system has continued to perform effectively, despite the fact that the twenty year capacity growth for which they were designed has long since passed, in most cases. As the number of work trips has increased, work trip travel times have declined while average work trip distances have increased. Commuting by automobile has increased more than 60% since 1970 but the average automobile driver spends 10% less time traveling 20% farther to work. In large part this is due to the impact of the Interstates. The highway commuting system with its Interstate backbone provides quicker commutes. Even in cities with urban rail systems, highway commuting speeds are up to 30% greater than rail commuting speeds.

Cost Effective

By increasing speed and expanding access, freight costs have been reduced substantially. Tractor-trailer operating costs have been estimated at 17% lower on Interstate highways than other highways, according to a 1983 USDOT report. The IHS:

- **Made less expensive land more accessible to the nation's transportation system and encouraged development;**
- **Made "just in time" delivery more feasible, reducing warehousing costs and adding to manufacturing efficiency;**
- **By broadening the geographical range and options of shoppers, the IHS has increased retail competition, resulting in larger selections and lower consumer prices;**
- **By improving inter-regional access, the IHS has helped to create a genuinely national domestic market with companies able to supply their products to much larger geographical areas less expensively**

Each of these cost reducing impacts have made both labor and capital more efficient and this has encouraged business expansion, new investment and job creation. Through the years, various estimates have been made of the contribution of the IHS to the economy, generally finding that the interstate highway system has more than paid for itself in improved commercial productivity.

Lives Saved

The IHS is by far the safest component of the nation's highway system and its use has reduced traffic accidents, saved lives and reduced injuries. A 1994 study found the fatality rate for interstate highways is nearly 60% lower that of the rest of the system (as measured in fatalities per 100 million person miles). It is estimated that use of the IHS in 1994 saved 6,100 lives, compared to the fatalities that would have occurred if there had been no Interstates. The injury rate for interstate highways is more than 70% lower that of the rest of the system. It is estimated that use of the interstates reduced traffic related injuries by 440K and reduced traffic accidents by more than 400 in 1994. Urban interstate fatality rates are more than 50% lower than that o other roads, while the injury rate is more than 70% lower. Urban interst te fatality rates are 65% lower than rail, while injury rates are 50% lower, per the 1994 study. There is a significant economic benefit to improved safety. Using *National Safety Council* (NSC) estimates of the direct economic cost of traffic accidents, it is estimated that the lower interstate accident rate in 1994 produced $17.2 billion in direct economic savings – nearly as much as the Federal Government spent on highways that year.

Afoot and light-hearted I take to the
open road,
Healthy, free, the world before me,
The long brown path before me
leading wherever I choose.

- Walt Whitman

In October 1990, POTUS *George HW Bush* - whose father, Senator *Prescott Bush* of *Connecticut*, had been a key supporter of the Clay Committee's plan in 1955 - signed legislation that changed the name of the Interstate system to the "Dwight D. Eisenhower System of Interstate and Defense Highways." This change acknowledged Eisenhower's pivotal role in launching the program.

<u>Above</u>: caption: "Unveiling the Eisenhower Interstate System sign on July 29, 1993, are (from left): Rep. Nick Rahall (D-WV), John Eisenhower (President Eisenhower's son), Federal Highway Administrator Rodney Slater, and Rep. Norman Mineta (D-CA)."


EISENHOWER
INTERSTATE
SYSTEM