

# How Many Interstate Programs Were There?

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## How Many Interstate Programs Were There?

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### Introduction

The public generally uses the expression "the Interstate" to refer not just to specific highways but to the concept of a connected national system of freeways.

Professionals [\[i\]](#) in the highway field also frequently refer to "the Interstate Program" as all the planning, funding, environmental consideration, administrative review, engineering, right-of-way acquisition, management, traffic control, and construction activities that went into building "the Interstate." These references are something of a misnomer because the Interstate Program has gone through so many changes that someone who worked with it in the 1950s would hardly recognize it today. In effect, that is because there was not just one Interstate Program; there were several of them.

### Typology

Below is a general typology of these "programs." The typology is analogous to a major platform of computer software that is periodically upgraded but users implement the upgrades at different times. Thus, at any given time, users are employing different software that is partly compatible and partly non-compatible with previous versions.

### Versions of the Interstate Program

In general, the Interstate Program has gone from a basic "connect the U.S." program funded by special Interstate Construction (IC) funds based on an Interstate Cost Estimate (ICE) to a "let's solve a lot of specific problems" type program. At first Interstate highways were little more than divided highways with interchanges and destination signs. Gradually, landscaping, advertising control, noise barriers, scenic treatments, rest areas, high occupancy and high occupancy/toll lanes, etc., were added. These changes were not done all at once and some older highways were retrofitted with advanced features. Many times the retrofit was done in conjunction with the addition of capacity (widening by a lane or more).

However, some things have not changed. Ownership is almost exclusively by States (with some toll facilities operated by a regional authority). Maintenance, excluding preventive maintenance, is also almost exclusively a State responsibility (although operation of some toll roads has been leased to private consortia).

Below is a summary of each version of the Interstate Program:

Program Version	Program Title	Start	End	Some Characteristics
Interstate Alpha and	How Many miles, where will it go.	1944 <a href="#">[ii]</a>	1956	Miles designated, some construction with Federal- aid Primary financing.

Program Version	Program Title	Start	End	Some Characteristics
beta tests				
Interstate Program 1.0	Build Basic Freeways Fast; incorporate toll roads as needed. Financing with IC based on cost-to-complete ICE.	1956 <a href="#">[iii]</a>	Between about 1965 and about 1980	Many miles of 4-lane highways; sometimes narrow medians; occasional left hand exits and short ramps.
Interstate Program 1.1	Build Basic Freeways Fast but with some extras; no new tolls	About 1965	About 1980	As with 1.0 but with wider medians, better landscaping
Interstate Program 2.0	Build Interstates but with more safety and more attention to the environment	About 1970	IC appropriations end in 1993; era essentially over by 1998.	Better interchanges; more attention to clear zones <a href="#">[iv]</a> ; environmental statements <a href="#">[v]</a> ; significant efforts to avoid, minimize and mitigate environmental impacts.
Interstate Program 2.1	Interstate Program with Transfers	Mid 1970s	Mid 1980s	ICE used to authorize funds for substitute highways and transit.
Interstate Program 3.0	Build Interstates to help solve non transportation problems; some leniency on tolling	About 1980	Hasn't ended yet <a href="#">[vi]</a>	Interstates used as catalyst to promote development or redevelopment.
Interstate Program 4.0	Congress designates Future Interstates; more leniency on tolling	1995 <a href="#">[vii]</a>	Hasn't ended yet.	Future Interstates designated per section 1105(e) of ISTEA. However, little dedicated funding available. Tolls may be placed on previously non-tolled sections of Interstate.
Interstate Program 4.1 or 5.0, 5.1, 5.2, 5.3?	Alternatives such as changes in design, financing or operations.	2005 <a href="#">[viii]</a>	?	?

## Cost Effect of the Evolution

One obvious effect of the evolution is that Interstate highways became more expensive. For example, below is the estimated Federal cost (in dollars not adjusted for inflation) of the Interstate System based on the ICE in selected years: [\[ix\]](#)

Era	Year of estimate	Estimated Federal Cost to Complete <a href="#">[x]</a>
IP 1.0	1958	\$ 34 billion
IP 1.1	1965	\$ 42 billion
IP 2.0	1975	\$ 80 billion
IP 3.0	1991	\$114 billion

The primary purpose of the ICE was to provide data for apportioning IC funds among the States based on each State's remaining cost to complete its Interstate mileage compared with the national cost. The 1991 ICE was the last such estimate. This was because the Intermodal Surface Transportation Efficiency Act of 1991, a.k.a., ISTEA, declared the authorizations in that Act to be "...the final authorizations of appropriations and apportionments for completion of

construction of such [Interstate] system." [\[xi\]](#) With ISTEA ending apportionment of IC funds after Fiscal Year 1996, no additional ICE was needed.

Of course the evolution of the Interstate Programs was not the only factor which increased costs. Among the other factors which affected cost were inflation, an increase in System mileage in 1968 and 1973, [\[xii\]](#) and changes in the definition of "completion."

## Decreasing Rate of New Interstates

With the increasing cost, there was a decrease in the number of new Interstate centerline miles being placed in service: [\[xiii\]](#)

Year	Centerline Miles Interstate Highway Open to Traffic <a href="#">[xiv]</a>	Increase from Previous Year Five Total
1970	29,335	NA
1975	35,309	5,974
1980	41,120	5,811
1985	43,588	2,468
1990	45,074	1,486
1995	45,744	670
2000	46,427	683
2005	46,873	446

## The ICE and the IC for Non-Interstate Projects

One of the interesting features of the Interstate Programs is that they resulted in funds for projects other than Interstate freeways. This was a feature of Interstate Program 2.1 for not-to-be-built Interstate highways. The 1973 Federal-Aid Highway Act allowed the ICE to be used as a fiscal device to authorize general funds from the U.S. Treasury to be used for construction of urban transit infrastructure (track or rolling stock) in place of an Interstate highway while reducing the ICE accordingly. [\[xv\]](#) The next authorization act, the 1976 Federal-Aid Highway Act, [\[xvi\]](#) similarly provided the ICE to be used as a fiscal device to authorize general funds from the U.S. Treasury to be used to construct non- Interstate highways. It also similarly required a reduction of the ICE. A decade and a half later, some transit projects, in southeast Wisconsin, were funded directly from IC funds. [\[xvii\]](#)

## Interstate Projects Without Interstate Construction Funds

Another interesting feature of the Interstate Programs is that non-IC funds were sometimes used for Interstate freeways. This was a feature of Interstate Programs 1.1 through 4.0. Also, the Federal Aid Highway Act of 1968 [\[xviii\]](#) initially allowed the Secretary of Transportation to designate additional highways as part of the Interstate System if they were a logical addition or connection, met Interstate standards and did not use IC funds. This wording is still in effect as of the date this paper was written (February 2008). [\[xix\]](#)

## Tolling

The Federal Highway Administration policy on tolling has gone through an evolution. Although initially no Federal-aid was to support toll road construction, by the time of the Federal-Aid Highway Act of 1978, Federal-aid, but not IC funds, could be used in studying State acquisition of private toll bridges. [\[xx\]](#) In the 1987 Surface Transportation and Uniform Relocation Assistance Act (a.k.a., P.L. 100-17), a pilot program was established to use Federal-aid to improve up to seven non-Interstate toll facilities. [\[xxi\]](#) In the 1991 ISTEA, wording was added specifically allowing Federal-aid funds to be used to improve highways, other than Interstates, that would then be subject to tolls as well as allowing toll

revenues to be used, subject to terms of a written agreement, [xxii] as credit for the non-Federal share required for Federal-aid projects. [xxiii] By the time of the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (a.k.a., SAFETEA-LU, P.L. 109-59), the previously noted wording had been expanded to encourage tolling, even on the Interstate. [xxiv] Notwithstanding the evolution in policy, the physical reality hasn't evolved as fast. In 1957, there were already about 1,800 centerline miles of toll roads on the Interstate with about another 300 centerline miles under (or soon to be under) construction. [xxv] A little over 50 years later, the total of toll centerline highway mileage on the Interstate system was about 2,900 miles (excluding the Interstates in Puerto Rico). [xxvi] Tolls had been dropped from some of the Interstate toll highways from 1957; however, other roads had been built as toll roads and added to the Interstate system.

## Future Interstate Programs

As of the date this paper was written, there have been discussions, proposals, and/or studies of changes that could be made in the Interstate System. [xxvii] The author has heard of discussions involving design innovations to address congestion (with or without tolling), such as special Interstate access lanes from industrial parks, truck interchange bypasses, and truck lanes added in conjunction with decreasing lane width for non truck lanes. Additionally, more substantial changes have been discussed, including a restart of the IC program for additional mileage. This might or might not include mileage that is identified in the designations of future Interstates that was placed in amendments to ISTEA. [xxviii] Options for design, financing, and/or operation might be possible for this additional mileage (or for expansion of existing Interstates).

Although the details of future changes to the Interstate Program cannot be accurately predicted, it seems very likely there will be changes. Thus there will likely be an Interstate Program 4.1 and/or 5.0, 5.1, etc. Exploring the pros and cons of these options is beyond the scope of this paper.

## Conclusion

The Interstate Program has gone through so many changes in so many areas that it is something of a misnomer to keep referring to it as if it were a single program. In the analysis above, the history of the Interstate is divided into six previous and an undetermined, but probably more than one, number of future programs. In general the earlier programs were more rudimentary in design, less attentive to environmental concerns and more restrictive regarding tolling than later programs. Although there is no consensus on what provisions future Interstate Programs should contain, there are numerous ideas, some consistent with continuation of the historic trend, some less so. Both the previous evolution and the existence of a robust discussion of possible future programs give testament to the utility and importance of the Interstate System.

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[i] Among these professionals, the author is indebted to the assistance of Frank Clark in the Office of Interstate and Border Planning and Richard Weingroff in the Office of the Associate Administrator for Infrastructure. Both have provided references and other information, especially about the pre-1991 history of the Interstate era.

[ii] It is possible to pick an earlier or later date since serious proposals for an Interstate System were common after the 1st World War or even earlier. The first designation of mileage was in 1947 and included rural mileage plus urban mileage carrying mainlines thorough major cities. The first designation of intra urban and urban bypass mileage was in 1955. However, Congress first authorized mileage (40,000 miles) in the Federal-Aid Highway Act of 1944 (P.L. 78-521). An authoritative history of the creation of the Interstate is at: <https://www.fhwa.dot.gov/publications/publicroads/96summer/>.

[iii] This is the year of the Federal-Aid Highway Act of 1956 (a.k.a., P.L. 84-627). It is possible to pick an earlier date since some sections of highway that already existed were incorporated into the Interstate System. Some such sections were completed as early as the 1940s.

[iv] Interstate design standards continue to be refined. For example, in 2005, FHWA began to adopt revised standards, developed by the American Association of State Highway and Transportation Officials, that affected the clear zone, see: <https://www.fhwa.dot.gov/programadmin/071105.cfm>. These standards became effective in 2006, see: <https://www.fhwa.dot.gov/programadmin/050806.cfm>.

[v] Environmental reviews were required by Section 102 of the National Environmental Policy Act (a.k.a., P.L. 91-190). Subsequent amendments, regulations, and judicial actions largely determined the format and content of the reviews, see: <http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm>.

[vi] The last year that IC funding was authorized was for 1996. The Intermodal Surface Transportation Efficiency Act of 1991 (a.k.a., ISTEA, a.k.a., P.L. 102-240) declared that the era of Interstate authorizations of appropriations and apportionments was over effective with that Act in Section 1001(a) and determined the last year of apportionment in Section 1001(c). However, per Section 139 (later section 103) of Title 23 of the United States Code (U.S.C.), qualified highways constructed with funds other than IC funds could be added to the Interstate System.

[vii] Section 1105(c) of ISTEA identified high priority corridors of the National Highway System (NHS), one of which (corridor 5) was called "I-73/74..." although the name did not grant IC funding or Interstate or future Interstate status. The wording in 1101(a) of ISTEA ended the authorization of IC funds after 1996. The 1995 NHS Designation Act (a.k.a., P.L. 104-59) amended Section 1105(e) of ISTEA to designate routes or portions of routes as future Interstates.

[viii] This is somewhat speculative. Although Sections 1601-1604 of SAFETEA-LU have provided substantial additional flexibility to create novel financial arrangements, there is no certainty that many substantive projects will use this flexibility.

[ix] <https://www.fhwa.dot.gov/programadmin/interstate.cfm>.

[x] The Federal cost was about 90 percent of the total cost. In addition, the Federal-Aid Highway Act of 1981 (a.k.a., 97-134) redefined "completion" to eliminate certain costs from the ICE, such as those associated with construction of more than 6 lanes in areas with populations below 400,000 and those associated with construction of more than 8 lanes anywhere. This revision lowered the cost estimate by about 11percent. This was required by Section 4 of the 1981 Act which amended Subsection (b) of Section 108 of the Federal-Aid Highway Act of 1956 (limiting eligible costs) and Section 104(b)(5)(A) of 23 U.S.C. (which required the lowered costs to be used in a revised ICE).

[xi] Section 1001(a) contained this declaration.

[xii] For example P.L. 90-238 (a.k.a., the Howard-Cramer Act) amended Section 103 of 23 U.S.C. with the following language: "...there is hereby authorized additional mileage of the Interstate System of two hundred miles, to be used in making modifications or revision in the Interstate Systems...." This mileage was to be used by States which wanted to withdraw designated sections of the Interstate and re-designate other sections of Interstate; subsequently, the Federal-Aid Highway Act of 1968 (a.k.a., P.L. 90-495) amended Section 103 with the language: "...there is hereby authorized additional mileage of not to exceed 1,500 miles of the designation of routes in the same manner as...." The Federal-Aid Highway Act of 1973 (a.k.a., P.L. 93-87) modified the language inserted by P.L. 90-238 by increasing the 200-mile Howard-Cramer addition to a 500-mile addition. More on this subject is available at: <https://www.fhwa.dot.gov/programadmin/interstate.cfm> and at: [https://www.fhwa.dot.gov/planning/national\\_highway\\_system/interstate\\_highway\\_system/routefinder/index.cfm](https://www.fhwa.dot.gov/planning/national_highway_system/interstate_highway_system/routefinder/index.cfm).

[xiii] Some of the increase in centerline mileage is by virtue of conversion of non-interstate divided highways to Interstate freeways. The ratio of "new" vs. converted mileage is not easily determined.

[xiv] The information for 1970 is from the M-12 table at: <http://isddc.dot.gov/OLPFiles/FHWA/012910.pdf>. The information for 1975 is from the M-12 table at: <http://isddc.dot.gov/OLPFiles/FHWA/013200.pdf>. The information for 1980, 1985, 1990 and 1995 is from the HM-220 tables available at: <https://www.fhwa.dot.gov/ohim/summary95/section5.html>. The information for 2000 is at the HM-20 table at: <https://www.fhwa.dot.gov/ohim/hs00/re.htm>. The 2005 information at the HM-20 table at: <https://www.fhwa.dot.gov/policy/ohim/hs05/hm/hm20.htm>. In each case mileage in the District of Columbia is counted. In addition, Interstate mileage in Alaska is counted but not signed. The highways in the Commonwealth of Puerto Rico that were constructed with IC funds to near Interstate standards are not counted and they are not signed as Interstates.

[xv] Section 137(b)(4) of the 1973 Act (a.k.a., P.L. 93-87) amended Section 103(e) of 23 U.S.C. In effect, the estimated cost of the withdrawn Interstate highway was authorized to be obligated from the U.S. Treasury general fund and provided to a transit grantee(s) via the Urban Mass Transportation Act of 1964 as amended. The funds were, in effect, supplementary to the regular funds authorized and available for transit projects. The estimated cost of the withdrawn Interstate highway was eliminated from the ICE. The resulting change in the ICE had the effect of redistribution of IC apportionments.

[xvi] Section 110 of the Federal-Aid Highway Act of 1976 (a.k.a., P.L. 94-280) further amended Section 103(e) such that in the case of highway projects that substituted for withdrawn Interstate highways, there were no IC authorizations for the substitute projects, but instead authorizations from the general fund of the U.S. Treasury. The effect on the ICE was similar to the case of substitute transit projects, that is, it resulted in a redistribution of future IC apportionments.

[xvii] Section 1045 of ISTEA allowed IC funds that would have been used for the I-94 East-West Transitway project (a highway) in Milwaukee and Waukesha County to be used for bus transit and light rail transit in that area as well as other highway projects in that area.

[xviii] Section 16(a) of the 1968 Act added Section 139 to 23 U.S.C.

[xix] Section 1106 of the 1998 Transportation Equity Act for the 21st Century (a.k.a., TEA-21, a.k.a., P.L. 105-178), moved the language to Section 103 of 23 U.S.C.

[xx] Section 120 of the Surface Transportation Assistance Act of 1978 (a.k.a., P.L. 95-599) amended Section 129 of 23 U.S.C.

[xxi] Section 120 of the 1987 Surface Transportation and Uniform Relocation Assistance Act (a.k.a., P.L. 100-17) further amended Section 129 of 23 U.S.C. The identification of 5 of the 7 locations for toll projects was specified, with two left to the discretion of the Secretary of Transportation.

[xxii] Section 1044 of ISTEA provided the authority to use toll revenues as credit for Federal-aid with the proviso that the State maintain or increase non-Federal capital expenditures.

[xxiii] The authority to allow Federal-aid to participate in toll road projects was in Section 1012 of ISTEA which modified Section 129 of 23 U.S.C.; as noted above the authority to use toll credits was in Section 1044 of ISTEA. Section 1111(b) of TEA-21 placed this wording in Section 120 of 23 U.S.C.

[xxiv] Per Sections 1601 through 1604 of SAFETEA-LU which established Chapter 6 of 23 U.S.C. and titled it "Infrastructure Finance." In addition these sections established an "Interstate System Construction Toll Pilot Program."

[xxv] See article titled, "Why Does the Interstate System Include Toll Facilities" at: <https://www.fhwa.dot.gov/infrastructure/tollroad.cfm>



[xxvi] <https://www.fhwa.dot.gov/policyinformation/tollpage/t1part3.cfm>

[xxvii] See for example: the topics discussed at the Transportation Research Board meetings in 2007 on managed lanes at: [http://managed-lanes.tamu.edu/related\\_work/TRB/TRB-MLJS-Managed\\_Lanes\\_at\\_TRB-2007.pdf](http://managed-lanes.tamu.edu/related_work/TRB/TRB-MLJS-Managed_Lanes_at_TRB-2007.pdf); the advocacy of high occupancy/toll lanes (a.k.a., HOT lanes) at: <http://www.reason.org/surfacetransportation41.shtml>; or the schedule of events at the International Bridge, Tunnel and Turnpike Association at: <http://www.ibtta.org/Events/pastpresdetail.cfm?ItemNumber=3049&navItemNumber=883>

[xxviii] Such designations are contained in amendments to Section 1105(e) of ISTEA, the first of which date to the 1995 NHS Act. Language in Section 1105(e) of ISTEA references certain corridors designated as congressional high priority corridors of the NHS per Section 1105(c) of ISTEA. As of mid-2007, over 4,000 miles had been designated as future Interstates per Section 1105(e). A depiction of these future Interstates is at: <https://www.fhwa.dot.gov/hep10/nhs/hipricorridors/hbcfilg.htm>

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