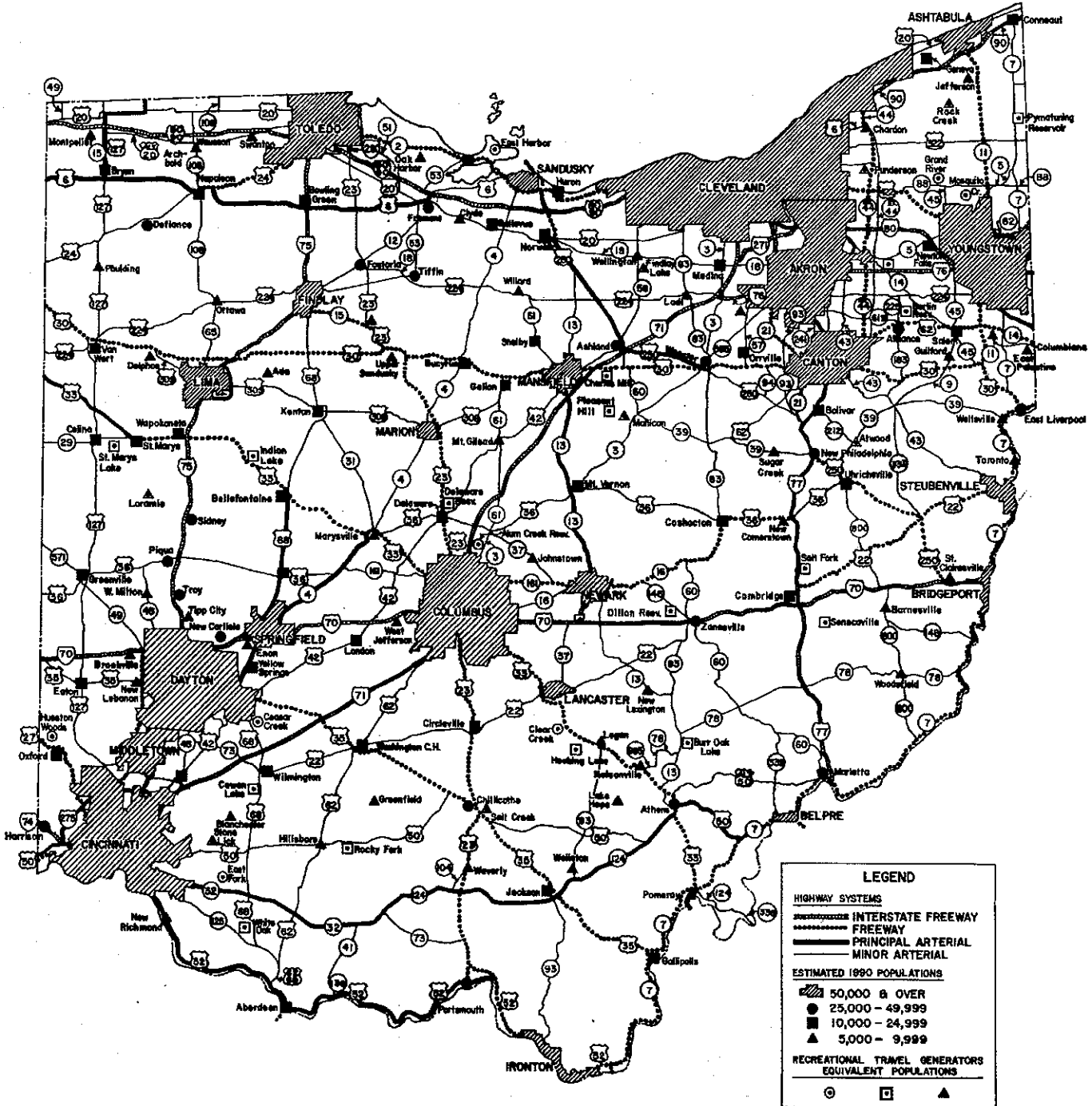


# HIGHWAY FUNCTIONAL CLASSIFICATION MAP

## SHOWING RURAL FREEWAYS AND ARTERIALS



(205) RURAL DESCRIPTIONS

205.1 RURAL FREEWAYS (RF)

.11 SERVICE FUNCTION - Rural Freeways are intended to serve traffic movements having longer trip lengths which are interstate or intrastate in character. These highways connect the larger cities, industrial concentration and recreational areas. They provide optimum mobility for through traffic. Rural freeways are intended to accommodate the movement of large volumes of traffic at high speeds under free-flow conditions.

To provide optimum mobility for through traffic, all access to adjacent lands is eliminated. No pedestrians or slow moving traffic is allowed.

.12 FLOW CHARACTERISTICS - On Rural Freeways, traffic should be uninterrupted and unrestricted. These conditions can only be achieved by grade separation of all railroads and crossroads, with vehicular access only at interchanges.

.13 VEHICLE TYPES - All types of vehicular traffic use Rural Freeways except bicycles and other slow moving vehicles. There are high volumes of truck traffic.

.14 STAGE CONSTRUCTION - All Rural Freeways should be planned and designed as multi-lane, divided, fully limited access facilities even though they may be developed by stage construction. In the plans for each stage of development, provision should be made for further improvements to existing sections.

205.2 RURAL PRINCIPAL ARTERIAL (RA)

.21 SERVICE FUNCTION - This system serves all urban areas over 50,000 population and most others over 25,000 population. This system provides an integrated network serving interstate and intrastate traffic without stub connections except at areas of concentrated traffic demand such as recreation areas, industrial complexes and airports. Rural Principal Arterial Roads are intended to carry large volumes of traffic at high speeds. The major difference between this class and the Freeway class is in the control of access. Where Freeways always have fully limited access, Rural Principal Arterials may vary from partial to no access control.

.22 FLOW CHARACTERISTICS - Rural Principal Arterial Roads carry heavy traffic volumes at high speeds and

should be designed for uninterrupted flow of traffic except at controlled intersections with major cross-roads. However, intersections on high speed roads controlled by traffic signals or stop signs are hazardous and should be avoided if at all possible. In some cases, grade separated interchanges may be warranted.

.23 VEHICLE TYPES - All types of vehicular traffic use Rural Principal Arterial Roads. There are high volumes of truck traffic.

#### 205.3 RURAL MINOR ARTERIAL (RMA)

.31 SERVICE FUNCTION - Rural Minor Arterial Roads are expected to provide for relatively high overall travel speeds, with minimum interference to through traffic. This system should, in conjunction with the Principal Arterial System, form an integrated network providing intrastate and intercounty service. This system should link cities, large towns and other large traffic generators to provide service to corridors with greater trip lengths than those served by the lower systems. They should be spaced at such intervals that all the developed areas of the State are within a reasonable distance of an Arterial Highway.

.32 FLOW CHARACTERISTICS - Rural Minor Arterial Roads should accommodate heavy traffic volumes but at a more moderate speed than that of the Principal Arterial Road system, since greater interference to traffic is allowed due to the greater number of access points.

.33 VEHICLE TYPES - All types of vehicular traffic use Rural Minor Arterial Roads. Trucks of all kinds use this system and may comprise a substantial percentage of the total volume.

#### 205.4 RURAL MAJOR COLLECTOR (RMC)

.41 SERVICE FUNCTION - Rural Major Collector Roads should provide service to any county seat or large town not served by the higher systems, and to other traffic generators of equal intracounty importance, such as consolidated schools, shipping points, county parks, etc. Through integration with higher systems, this system also links these places with nearby larger towns or cities and serves as the more important intracounty corridors.

.42 FLOW CHARACTERISTICS - On Rural Major Collector Roads the trips are shorter than on arterial routes, and, therefore, more moderate travel speeds can be tolerated. Traffic is interrupted by stop conditions or signalized intersections with Arterials or other Connector Roads and also by vehicles.

401 BASIC DESIGN STANDARDS

CRITICAL LENGTH OF GRADE FOR ALL DESIGN SPEEDS OF 30 MPH OR MORE

PERCENT OF GRADE	CRITICAL LENGTH IN FEET
Less than 2	* 3500
2	2350
2.5	1800
3	1500
3.5	1250
4	1075
4.5	950
5	850
5.5	750
6	*
Over 6	*

(G) Shoulders to be bituminous treated 4 feet each side of pavement where total of current Type B and C vehicles exceeds 250 per day, or if required for erosion control.

(H) 4-foot-wide bituminous treatment on the left side of divided directional pavements and 8-foot-wide bituminous treatment on right side of all pavements if current average total of Type B and C units is less than 1000 per day. 4-foot-wide paving on left side of divided, directional pavements and 8-foot-wide paving on right side of all pavements if current average total of B and C units is more than 1000 per day.

(I) Vertical clearance for Strategic Network may vary plus or minus 2 inches. The "Strategic Network" comprises all rural, Interstate Mileage and approved Urban or Bypass Interstate Mileage.

(K) These minimum dimensions apply if the route is not on the Strategic Network. Design tolerance is not to exceed 4 inches, plus.

(L) Where continuous barrier curbs are used on narrow medians, such curbs shall be offset at least one foot from the edge of the through traffic lane. Where vertical elements more than 12 inches high, other than abutments, piers, or walls, are located in a median, there shall be a lateral clearance of at least 3.5 feet from the edge of through traffic lane to the face of such elements.

(M) To face of parapet or guard rail.

(N) The Engineer of Bridges and Structures shall be consulted for structure criteria not covered herein.

(P) A desirable minimum longitudinal grade of 0.48% is recommended for all pavements. A minimum grade of 0.24% may be used in areas where the terrain is extremely flat. Flatter grades will require special ditches for uncurbed pavements and a more expensive drainage system for curbed pavements.

(Q) See table 602-2 for appropriate superelevation rates which are based on a maximum superelevation rate of 0.06 ft/ft.

\* Not a factor in terrain selection.

(5) Adjust grades as necessary to fit criteria, or assume new terrain classification and repeat procedure.

For design speeds of 50 MPH or greater, areas in which grades must exceed 6 percent shall be considered rugged and no restriction on length of critical grade need be applied. For design speeds less than 50 MPH, type of terrain shall be arbitrarily chosen, and restriction on length of grade need not be applied.

If, after the investigation of a grade line, it is found that the critical length of grade must be exceeded, consideration should be given to the addition of truck lanes.

If truck lanes are necessary, on 2-lane highway, and the length of the lanes are over 10% of the total distance between important termini, consideration should be given to the construction of a divided multi-lane project in the restricted section.

(C) Percentage of total length of passing sight distance opportunities of 1500 feet in length, measured from eye height to road surface, shall not be less than 70% of the total project length.

(D) Same as (C) except that percentage of total length shall not be less than 50%.

(E) Minimum and Desirable Stopping Sight Distance are based on height of eye of 3.75 feet and height of object of 5 inches. Passing Sight Distance is based on a height of eye of 3.75 feet and height of object of 4.5 feet.

(F) Effective shoulder is the width of shoulder measured between the edge of the pavement and the face of the guard rail.

401.1 GENERAL  
The following criteria are the basic standards to be used in designing highways in the State of Ohio. Where there is a choice of a minimum or desirable criteria, the desirable should be used.

401.2 REFERENCE ITEMS PERTAINING TO TABLE 401-1  
The following lettered items, A thru Q, refer to various items that are on Table 401-1. To fully understand the table these references should be used.

(A) Design Year traffic volumes may be obtained from the Bureau of Technical Services. If Design Year traffic volumes are not available from the Bureau of Technical Services, an approximate method of determining Design Year traffic is shown below in reference "B". Design Year ADT volumes in the range of 4,000 to 9,000 vehicles should be investigated for required number of initial or future lanes, using the more detailed analysis of the Highway Capacity Manual and/or the AASHTO publications titled "A Policy on Geometric Design of Rural Highways" and "A Policy on Design of Urban Highways and Arterial Streets".

(B) FORMULA FOR ADJUSTING CURRENT AVERAGE DAILY TRAFFIC:

Current (P+A) traffic + T(B+C) traffic. T varies with the type of terrain as shown:

Terrain:	Flat	Rolling	Hilly	Rugged
T	2	4	6	8

TO INCREASE CURRENT ADT TO DESIGN TRAFFIC:

Multiply the computed volume above by the factor (indexed below) corresponding to the applicable locale.

Design Yr.	Locale Factor		
	Urban	Suburban	Rural
20	1.40	1.70	1.60
10	1.20	1.35	1.30
5	1.10	1.18	1.15

TERRAIN SELECTION

Selection of terrain for the purpose of determining adjustment factor shall be made, as follows, for design speeds of 50 MPH or more except in rugged terrain:

(1) Assume a reasonable terrain classification, and calculate the probable design traffic.

(2) From Table 401-1 find the maximum grade allowed for the type of terrain selected in (1).

(3) Check the project grade line to determine whether any grade must exceed the maximum allowable.

(4) If no grade exceeds the maximum, determine whether the length of any allowable grade must exceed the critical length indicated in the following table.

BASIC MINIMUM DESIGN STANDARDS FOR STATE HIGHWAYS																			
OHIO DEPARTMENT OF TRANSPORTATION, BUREAU OF LOCATION AND DESIGN																			
FUNCTIONAL CLASSIFICATION	TYPE OF HIGHWAY	CONDITIONS				GEOMETRICS						ROADWAYS				STRUCTURES (N)			
		DESIGN TRAFFIC ADT	LOCALE OR TERRAIN (B)	DESIGN SPEED	CURVATURE	GRADES	SIGHT DISTANCE	PAVEMENT	MINIMUM EFFECTIVE	SHOULDERS	ROADWAY WIDTH IN EXCESS OF TRAVEL LANE(S)	MINIMUM	DESIRABLE	VERTICAL CLEARANCE OVER PAVEMENTS	SHOULDERS				
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)				
RURAL AND URBAN FREEWAYS (RF) AND (UF)	INTER STATE	6000 and Over	Rural Suburban Urban	80	2°30' to 5°00'	1°28' to 2°00'	2	24	750	1050	Does Not Apply	Divided Highway	12' Right 6' Left	Paved 10' Right 4' Left	12' Right 6' Left	30' Right 6.5' Left (L)	40' Right 8' Left	16.5' (J) 15.0' (K) 14.0' (L) 15.0' (K) 14.0' (K)	15'
	STATE FREEWAYS	6000 to 4000	Rural Suburban Urban	60	2°30' to 5°00'	1°28' to 2°00'	2	24	750	1050	Does Not Apply	Divided Highway	10' Right 6' Left	H	10' Right 6' Left	30' Right 6.5' Left (L)	40' Right 8' Left	15'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	4000 to 2000	Rural Suburban Urban	70	2°30' to 5°00'	1°28' to 2°00'	3	24	600	850	Does Not Apply	24' Pav't on 4 Lane R/W	10' Right 10' Left	Bit. Treat 4' Both Sides	10' Right 10' Left	10' Right 10' Left	Effective Shoulder + 2 ft.	15'	
	STATE FREEWAYS	4000 to 2000	Rural Suburban Urban	70	2°30' to 5°00'	1°28' to 2°00'	3	24	600	850	Does Not Apply	24' Pav't on 4 Lane R/W	10' Right 10' Left	Bit. Treat 4' Both Sides	10' Right 10' Left	10' Right 10' Left	Effective Shoulder + 2 ft.	15'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	6000 and Over	Flat Rolling Hilly	60	3°30' to 8°00'	1°28' to 3°00'	3	24	600	850	Does Not Apply	Divided Highway	10' Right 6' Left	(H)	Effective Shoulders	10' Right 6.5' Left (L)	40' Right 8' Left	15'	
	STATE FREEWAYS	6000 to 4000	Flat Rolling Hilly	60	3°30' to 8°00'	1°28' to 3°00'	3	24	600	850	Does Not Apply	24' Pav't on 4 Lane R/W	10' Right 10' Left	Bit. Treat 4' Both Sides	10' Right 10' Left	10' Right 10' Left	Effective Shoulder + 2 ft.	15'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	4000 to 2000	Flat Rolling Hilly	50	3°30' to 8°00'	1°28' to 3°00'	3	24	600	850	Does Not Apply	24' Pav't on 4 Lane R/W	10' Right 10' Left	Aggregate 4' Both Sides(G)	10' Right 10' Left	10' Right 10' Left	Effective Shoulder + 2 ft.	15'	
	STATE FREEWAYS	4000 to 2000	Flat Rolling Hilly	50	3°30' to 8°00'	1°28' to 3°00'	3	24	600	850	Does Not Apply	24' Pav't on 4 Lane R/W	10' Right 10' Left	Aggregate 4' Both Sides(G)	10' Right 10' Left	10' Right 10' Left	Effective Shoulder + 2 ft.	15'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	2000 to 1000	Flat Rolling Hilly	40	3°30' to 8°00'	1°28' to 3°00'	3	24	475	650	Does Not Apply	22'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	14.5'	
	STATE FREEWAYS	2000 to 1000	Flat Rolling Hilly	40	3°30' to 8°00'	1°28' to 3°00'	3	24	475	650	Does Not Apply	22'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	14.5'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	1000 to 400	Flat Rolling Hilly	35	3°30' to 8°00'	1°28' to 3°00'	3	24	315	450	Does Not Apply	20'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	14.5'	
	STATE FREEWAYS	1000 to 400	Flat Rolling Hilly	35	3°30' to 8°00'	1°28' to 3°00'	3	24	315	450	Does Not Apply	20'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	8' 8' 8'	14.5'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	400 to 100	Flat Rolling Hilly	30	3°30' to 8°00'	1°28' to 3°00'	3	24	275	300	Does Not Apply	20'	8' 6' 4'	Aggregate 4' Both Sides(G)	8' 6' 4'	8' 6' 4'	8' 6' 4'	14.5'	
	STATE FREEWAYS	400 to 100	Flat Rolling Hilly	30	3°30' to 8°00'	1°28' to 3°00'	3	24	275	300	Does Not Apply	20'	8' 6' 4'	Aggregate 4' Both Sides(G)	8' 6' 4'	8' 6' 4'	8' 6' 4'	14.5'	
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	3000 and Over	Urban	50	7°30' (Q)	3°	6	24	350	450	Does Not Apply	Four 12-Foot Lanes	10'	(H)	10'	10'	15'		
	STATE FREEWAYS	3000 and Over	Urban	50	7°30' (Q)	3°	6	24	350	450	Does Not Apply	Four 12-Foot Lanes	10'	(H)	10'	10'	15'		
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	9000 to 6000	Urban	60	7°30' (Q)	3°	6	24	350	450	1800 (C)	24' Pav't on 4 Lane R/W	10'	Bit. Treat 4' Both Sides	10'	10'	15'		
	STATE FREEWAYS	9000 to 6000	Urban	60	7°30' (Q)	3°	6	24	350	450	1800 (C)	24' Pav't on 4 Lane R/W	10'	Bit. Treat 4' Both Sides	10'	10'	15'		
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	3000 to 1000	Urban	45	9° (Q)	5°	7	—	315	375	1600 (D)	22	8'	Aggregate 4' Both Sides(G)	8'	8'	14.5'		
	STATE FREEWAYS	3000 to 1000	Urban	45	9° (Q)	5°	7	—	315	375	1600 (D)	22	8'	Aggregate 4' Both Sides(G)	8'	8'	14.5'		
RURAL AND URBAN FREEWAYS (RF) AND (UF)	STATE FREEWAYS	Under 1000	Urban	35	15° (Q)	8°	8	—	240	250	—	20	8'	Aggregate 4' Both Sides(G)	8'	Effective Shoulder + 2 ft.	14.5'		
	STATE FREEWAYS	Under 1000	Urban	35	15° (Q)	8°	8	—	240	250	—	20	8'	Aggregate 4' Both Sides(G)	8'	Effective Shoulder + 2 ft.	14.5'		