

**FY 2019-2020 Virginia Beach Budget
Response to Council Questions**

Question Number: FY 20 01

Question: Please provide a matrix showing a timeline of when each functionally obsolete bridge will become structurally deficient.

Date Requested: February 5th, 2019

Requested By: Councilmember Moss

Department: Public Works, Roadways

Response:

Information regarding the status of bridges can be found on VDOT's website at the following locations:

VDOT Website Link: http://www.virginiadot.org/info/bridge_lists.asp

Hampton Roads

District List: <http://dashboard.virginiadot.org/Pages/Maintenance/AdvancedBridgeReport.aspx?districtCode=5>

A comprehensive list detailing the status and recent inspection dates of Virginia Beach's bridges and culverts from VDOT's website is attached. Additional information for each structure can be found in the individual inspection report.



Bridge Condition Code key

<u>Code</u>	<u>Description</u>
N	NOT APPLICABLE
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION No problems noted.
7	GOOD CONDITION Some minor problems.
6	SATISFACTORY CONDITION Structural elements show some minor deterioration.
5	FAIR CONDITION All primary structural elements are sound but may have some minor section loss (due to corrosion), cracking, spalling (deterioration of concrete surface) or scour (erosion of soil)
4	POOR CONDITION Advanced section loss, deterioration, spalling or scour.
3	SERIOUS CONDITION Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2	CRITICAL CONDITION Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1	"IMMINENT" FAILURE CONDITION Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
0	FAILED CONDITION Out of service - beyond corrective action.

What are “general condition ratings?” According to the National Bridge Inspection Standards (NBIS), condition ratings are used to describe an existing bridge or culvert compared with its condition if it were new. The ratings are based on the materials, physical condition of the deck (riding surface), the superstructure (supports immediately beneath the driving surface) and the substructures (foundation and supporting posts and piers). General condition ratings range from 0 (failed condition) to 9 (excellent). For detailed definitions, click [here](#).

Which bridges are included in the NBI system? NBI structures are bridges or culverts that carry vehicular traffic and have an opening longer than 20 feet measured along the center of the roadway.

What bridges are not considered part of the NBI system? Non-NBI structures include bridges or culverts that carry vehicular traffic and are equal to or less than 20 feet measured along the center of the roadway.

VDOT exceeds the NBI standards by inspecting and documenting in our inventory all bridges regardless of their length and all culverts having an opening greater than 36 square feet.

What is a “structurally deficient” bridge? Bridges are considered structurally deficient if they have been restricted to light vehicles, closed to traffic or require rehabilitation. Structurally deficient means there are elements of the bridge that need to be monitored and/or repaired. The fact that a bridge is “structurally deficient” does not imply that it is likely to collapse or that it is unsafe. It means the bridge must be monitored, inspected and maintained.

How is “structural deficiency” determined? The condition of different parts of a bridge is rated on a scale of 0 to 9 (with 9 being “excellent” and zero being “failed”). A structurally deficient bridge is one for which the deck (riding surface), the superstructure (supports immediately beneath the driving surface) or the substructure (foundation and supporting posts and piers) are rated in condition 4 or less.

What makes a bridge structurally deficient, and are structural deficient bridges unsafe? The fact that a bridge is “structurally deficient” does not imply that it is likely to collapse or that it is unsafe. A “deficient” bridge is one with some maintenance concerns that do not pose a safety risk. A “deficient” bridge typically requires maintenance and repair and eventual rehabilitation or replacement to address deficiencies. To remain open to traffic, structurally deficient bridges are often posted with reduced weight limits that restrict the gross weight of vehicles using the bridges. If unsafe conditions are identified during a physical inspection, the structure must be closed.

What is a “functionally obsolete” bridge? A functionally obsolete bridge is one that was built to standards that are not used today. These bridges are not automatically rated as structurally deficient, nor are they inherently unsafe. Functionally obsolete bridges are those that do not have adequate lane widths, shoulder widths, or vertical clearances to serve current traffic demand, or those that may be occasionally flooded.

A functionally obsolete bridge is similar to an older house. A house built in 1950 might be perfectly acceptable to live in, but it does not meet all of today's building codes. Yet, when it comes time to consider upgrading that house or making improvements, the owner must look at ways to bring the structure up to current standards.

What is a “fracture-critical” bridge? A fracture-critical bridge is one that does not contain redundant supporting elements. This means that if those key supports fail, the bridge would be in danger of collapse. This *does not* mean the bridge is inherently unsafe, only that there is a lack of redundancy in its design.

What is a bridge's “sufficiency rating?” Sufficiency ratings were developed by the Federal Highway Administration to serve as a prioritization tool to allocate funds. The rating varies from 0 percent (poor) to 100 percent (very good). The formula considers structural adequacy, whether the bridge is functionally obsolete and level of service provided to the public.

History of Federal Bridge Inspection Program The federal bridge inspection program regulations were developed as a result of the Federal-Aid Highway Act of 1968 following the collapse of the Silver Bridge in Point Pleasant, West Virginia. The United States Secretary of Transportation established the National Bridge Inspection Standards (NBIS) to locate and evaluate existing bridge deficiencies to ensure the safety of the traveling public.

The 1968 Federal-Aid Highway Act directed the states to maintain an inventory of federal-aid highway system bridges. This was amended over time to establish criteria for NBIS bridges including:

- Defining the NBIS to bridges to those on the federal-aid highway system
- Requiring inspections of bridges longer than 20 feet on all public roads
- Expanding bridge inspection programs to include special inspection procedures for fracture-critical members and underwater inspection

Virginia Beach Bridges - February 2019

Route Name	Crossing	Type	Year Built	Deck Cond	Super Cond	Sub Cond	Culvert Cond	Func Obslt	Struc Defic	Last Inspected	Responsibility	Structure Length (FT)	Structure Width (FT)	Avg Daily Traffic	Road System
264	Great Neck Creek	Bridge	1967	6	6	6	N			10/31/18	VDOT	171	134	53360	Interstate
264	London Bridge Creek	Bridge	1967	6	6	6	N			10/31/18	VDOT	168	148	101094	Interstate
264	RR & London Br Rd Ramp	Bridge	1967	7	6	6	N	FO		10/05/18	VDOT	337	136	102352	Interstate
264	Lynnhaven Pkwy	Bridge	1967	7	5	5	N			08/29/18	VDOT	211	163	142297	Interstate
264	First Colonial Road	Bridge	1967	7	6	5	N			09/27/18	VDOT	190	148	53360	Interstate
264	London Bridge Road	Bridge	1967	6	5	5	N	FO		05/24/18	VDOT	211	136	102352	Interstate
BLACKWATER ROAD	MILLDAM CREEK	Bridge	1992	8	8	7	N			08/07/18	City	47	33	764	Urban
Blackwater Road	Blackwater Creek	Bridge	1975	6	6	7	N			09/13/17	City	150	35	1269	Urban
Bow Creek Blvd.	Drainage Canal	Bridge	1996	7	7	7	N			02/08/18	City	90	44	5796	Urban
Constitution Drive	Thalia Creek	Bridge	2010	7	7	7	N			10/10/18	City	290	89	6200	Urban
CULVER LANE	DRAINAGE CANAL	Bridge	1989	N	7	7	N			07/25/18	City	43	86	9751	Urban
Dam Neck Road	Drainage Canal	Bridge	1991	6	6	6	N			10/31/17	City	32	81	16399	Urban
DAM NECK ROAD	CANAL 4	Bridge	2006	N	8	8	N			08/07/18	City	22	45	1798	Urban
Diamond Springs NBL	Waterworks Canal	Bridge	2009	7	7	8	N			08/03/17	City	56	37	26237	Primary
Diamond Springs SBL	Waterworks Canal	Bridge	2010	7	7	8	N			08/03/17	City	56	34	26237	Primary
DORCHESTER LANE	DRAINAGE CANAL	Bridge	1986	7	7	7	N			12/18/18	City	120	37	2790	Urban
E GREEN GARDEN CIR	SUNSET CANAL	Bridge	1973	7	7	7	N			04/13/17	City	45	44	1377	Urban
EBL DAM NECK ROAD	WEST NECK CREEK	Bridge	1992	7	7	7	N			02/06/17	City	75	41	20846	Urban
EBL FERRELL PARKWY	SALEM ROAD	Bridge	1993	7	7	7	N			07/10/17	City	175	63	19460	Urban
EBL Providence Rd.	IS 64 & HOV	Bridge	1967	6	6	6	N	FO		02/16/17	VDOT	246	37	8969	Urban
ELBOW ROAD	DRAINAGE CANAL	Bridge	1960	8	8	6	N	FO		04/27/17	City	21	20	11143	Urban
FERRELL PARKWAY	RT. 165 PRINCESS ANNE RD	Bridge	1993	7	7	6	N			07/10/17	City	197	80	19460	Urban
FERRELL PARKWAY	SALEM WOODS CANAL	Bridge	1993	7	7	7	N			07/07/17	City	157	115	38919	Urban
GEN BOOTH BLVD	RUDEE INLET	Bridge	1968	5	6	6	N	FO		09/19/18	City	683	37	8366	Urban
GENERAL BOOTH BLVD	RUDEE INLET	Bridge	1995	7	7	7	N	FO		09/25/18	City	699	46	8366	Urban
Great Neck Rd SBL	Broad Bay Rd & Long Cr.	Bridge	1988	7	7	7	N	FO		09/12/17	City	1122	37	13351	Primary
I-264	Rosemont Road	Bridge	1967	6	5	6	N			03/26/18	VDOT	170	162	142297	Interstate
I-264	Independence Blvd	Bridge	1967	6	5	5	N	FO		08/29/18	VDOT	166	169	146705	Interstate
Indian River Road	North Landing River	Bridge	1997	6	7	7	N			02/23/18	City	45	48	6017	Urban
INDIAN RIVER ROAD	BRANCH WEST NECK CREEK	Bridge	1975	4	5	5	N		SD	05/29/18	City	73	36	4667	Urban
Inlet Road	Inlet of Lynnhaven River	Bridge	1982	6	5	5	N	FO		03/27/18	City	27	11	10	Urban
INTERNATIONAL PKWY	DRAINAGE CANAL #2	Bridge	1987	7	7	7	N	FO		05/24/17	City	158	36	4907	Urban
INTERNATIONAL PKWY	DRAINAGE CANAL #2	Bridge	1997	7	7	7	N	FO		05/24/17	City	158	39	4907	Urban
INTERSTATE 64 EBL	E Br Elizabeth River	Bridge	1967	6	6	5	N	FO		05/10/17	VDOT	1461	78	70438	Interstate
INTERSTATE 64 WBL	E Br Elizabeth River	Bridge	1967	6	6	5	N	FO		05/10/17	VDOT	1540	78	69288	Interstate
Interstate Rte. 26	Birdneck Road	Bridge	1967	6	5	5	N			09/27/18	VDOT	186	150	24631	Interstate
IS 264	Abandoned NS RR	Bridge	1967	6	5	5	N			07/20/18	VDOT	226	158	178909	Interstate
IS 264	Plaza Trail	Bridge	1967	6	5	6	N			03/19/18	VDOT	170	134	142297	Interstate
IS 264	US 58 Va Beach Blvd	Bridge	1967	7	7	5	N			09/27/18	VDOT	395	134	65929	Interstate
IS 264	SR190 Witchduck Road	Bridge	1967	7	5	5	N			05/31/18	VDOT	188	157	185647	Interstate
IS 264 EBL Off Ramp	IS 264	Bridge	1967	7	6	6	N			05/22/18	VDOT	360	30	18294	Interstate
Kempsville Road	Fox Run	Bridge	2014	8	8	8	N			03/27/17	City	50	128	30000	Primary
Laskin Road	Linkhorn Bay	Bridge	1938	5	4	4	N		SD	09/28/18	City	132	68	28936	Primary

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Lynnhaven Parkway	Drainage Canal	Bridge	1989	7	7	6	N			03/26/18	City	120	86	19967	Urban
Lynnhaven Parkway	London Bridge Creek	Bridge	2010	7	7	7	N			01/24/18	City	94	117	31093	Primary
LYNNHAVEN PARKWAY	CHARLESTWN LAKES N	Bridge	2016	7	8	8	N	FO		11/16/18	City	75	91	5454	Urban
MUDDY CREEK ROAD	BRANCH NORTH BAY	Bridge	1985	7	7	7	N			06/28/17	City	29	34	262	Urban
NAWNEY CREEK ROAD	NAWNEY CREEK	Bridge	1982	7	7	7	N			11/26/18	City	52	34	438	Urban
NBL GREAT NECK RD.	Broad Bay Rd & Long Cr	Bridge	1988	7	7	7	N	FO		09/11/17	City	1122	41	13351	Primary
NBL INDEPEND. BLVD	RTE.13 NORTHAMPTON	Bridge	1969	6	7	7	N			11/29/18	City	209	50	20097	Primary
NBL LYNNHAVEN PKWY	LONDON BRIDGE CREEK	Bridge	1974	7	7	7	N			04/14/17	City	113	49	14509	Urban
NBL NORTHHAMPTON_B	ROUTE 60 (SHORE DRIVE)	Bridge	1963	6	7	6	N			06/12/17	City	211	35	12120	Primary
PINEWOOD ROAD	LITTLE NECK CREEK	Bridge	2013	8	8	8	N			04/10/17	City	150	42	1221	Urban
Princess Anne Road	Drainage Canal	Bridge	1997	7	7	7	N	FO		06/08/17	City	74	46	23672	Primary
PUNGO FERRY ROAD	NORTH LANDING RIVER	Bridge	1991	6	6	7	N			03/24/17	City	3640	38	2973	Urban
Ramp to Laskin Road	US 58 Va Beach Blvd	Bridge	1967	6	6	7	N			06/14/18	VDOT	250	50	14696	Primary
ROSEMONT ROAD	SUNSET CANAL	Bridge	1975	7	7	6	N			06/28/17	City	45	88	18691	Urban
ROUTE 0000	S PLAZA TR O DRAIN CANAL	Bridge	1992	7	7	7	N			02/03/17	City	42	49	8914	Urban
ROUTE 0000	London Bridge Creek	Bridge	1977	7	6	7	N	FO		07/06/17	City	198	62	7792	Urban
ROUTE 165	WEST NECK CREEK	Bridge	2014	7	8	7	N			07/06/18	City	1602	105	25000	Primary
ROUTE 165	HUNT CLUB TRIB.	Bridge	2014	8	8	8	N			07/05/18	City	120	106	25000	Primary
Rte. 264 EBL Ramp	Baxter Road	Bridge	1990	6	6	6	N	FO		05/23/18	VDOT	107	43	20577	Interstate
S INDEPENDENCE BLD	DRAINAGE CANAL	Bridge	1990	6	6	6	N			04/04/18	City	120	73	7400	Urban
S LYNNHAVEN ROAD	LONDON BRIDGE CREEK	Bridge	1966	6	6	5	N			04/29/18	City	72	61	15995	Urban
Sandbridge Road	Hells Point Creek	Bridge	1961	5	5	7	N	FO		11/16/18	City	76	29	9980	Urban
SBL INDEPEND. BLV	RTE 13 NORTHAMPTON	Bridge	1969	6	7	7	N			11/29/18	City	209	50	20097	Primary
SBL LYNNHAVEN PKWY	LONDON BRIDGE CREEK	Bridge	1974	7	7	7	N			04/14/17	City	113	49	14509	Urban
SBL NORTHHAMPTON B	ROUTE 60 (SHORE DRIVE)	Bridge	1963	6	7	6	N			01/12/17	City	211	35	12120	Primary
SHIPS CORNER ROAD	DRAINAGE LYNH IN	Bridge	2006	N	7	7	N			07/25/18	City	44	65	7493	Urban
SHORE DRIVE	Ferry Road and RR	Bridge	1986	7	7	7	N			04/20/18	City	256	77	30723	Primary
SHORE DRIVE EBL; RTE 60	LYNNHAVEN INLET	Bridge	2018	7	7	7	N			08/29/18	City	1579	54	16687	Primary
SHORE DRIVE WBL; RTE 60	LYNNHAVEN INLET	Bridge	2016	7	7	8	N			10/30/18	City	1579	54	16681	Primary
SR407 INDIAN RV RD	IS 64 & HOV	Bridge	1993	6	7	5	N			01/18/18	VDOT	312	119	31939	Urban
VA. Beach Blvd.	London Bridge Creek	Bridge	1989	7	7	7	N			10/04/17	City	167	150	40460	Primary
VA.BEACH BLVD.	IS 264 WBL Ramp	Bridge	1967	6	7	6	N	FO		06/14/18	VDOT	249	100	29391	Primary
Virginia Beach Blvd.	Thalia Creek	Bridge	1987	7	7	7	N			03/26/18	City	122	150	46554	Primary
W GREAT NECK RD	LONG CREEK CA. & BR.BY R	Bridge	1961	6	6	6	N	FO		09/26/18	City	882	35	6297	Urban
W GREEN GARDEN CIR	SUNSET CANAL	Bridge	1973	6	7	7	N			04/13/17	City	45	44	1063	Urban
WBL DAM NECK ROAD	WEST NECK CREEK	Bridge	1992	7	7	7	N			02/06/17	City	75	45	20846	Urban
WBL FERRELL PARKWY	SALEM ROAD	Bridge	1993	7	7	7	N			07/13/17	City	174	58	19460	Urban
WBL PROVIDENCE RD.	IS 64 & HOV	Bridge	1967	6	6	6	N	FO		02/16/17	VDOT	246	37	8969	Urban
WEST NECK ROAD	West Neck Creek	Bridge	1993	7	7	7	N			05/03/17	City	298	38	2804	Urban
264	Trib Wolfsnare Creek	Culvert	1967	N	N	N	7			11/20/17	VDOT	26	178	65929	Interstate
264	Trib Buchanan Creek	Culvert	1967	N	N	N	7			11/14/17	VDOT	20	221	146705	Interstate
264	Trib E Br Elizabeth Rvr	Culvert	1967	N	N	N	7			12/11/17	VDOT	8	410	185647	Interstate
264	Trib Thalia Creek	Culvert	1967	N	N	N	7			11/14/17	VDOT	20	320	185647	Interstate

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264	Pinetree Branch	Culvert	1967	N	N	N	7			11/20/17	VDOT	18	219	142297	Interstate
264	Thalia Creek	Culvert	1967	N	N	N	7			11/14/17	VDOT	28	216	146705	Interstate
00264 RAMPS	Trib Thalia Creek	Culvert	1967	N	N	N	7			12/11/17	VDOT	13	230	5454	Interstate
00264 VA BEACH EXP	Trib E Br Elizabeth Rvr	Culvert	1967	N	N	N	6			11/14/17	VDOT	60	277	178909	Interstate
00264 WBL	Trib Little Neck Creek	Culvert	1967	N	N	N	7			11/20/17	VDOT	6	62	24631	Interstate
00264 WBL OFF-RAMP	Trib Thalia Creek	Culvert	1967	N	N	N	7			12/11/17	VDOT	17	84	5454	Interstate
BONNEY ROAD	TIDAL STREAM	Culvert	1982	N	N	N	6			06/15/17	City	43	71	12800	Urban
BOW CREEK BLVD.	DRAINAGE CANAL	Culvert	2000	N	N	N	6			07/14/18	City	21	63	5796	Urban
BOW CREEK BOULEVAR	DRAINAGE CANAL	Culvert	2000	N	N	N	7			07/14/18	City	36	65	5796	Urban
CLUB HOUSE ROAD	DRAINAGE CANAL	Culvert	2000	N	N	N	7			07/14/18	City	40	52	100	Urban
Ferrell Parkway	Drainage Canal	Culvert	1976	N	N	N	6			10/04/17	City	25	126	38823	Urban
GRAGS CAUSEWAY	MILL DAM CREEK	Culvert	2015	N	N	N	8			09/28/17	City	22	40	382	Urban
GREAT NECK ROAD	WOLFSNARE CREEK	Culvert	1979	N	N	N	6			07/17/17	City	47	139	18936	Primary
Greenwich Road	Drainage Canal	Culvert	1932	N	N	N	5			12/27/17	City	33	82	5506	Urban
HEAD OF RIVER ROAD	BLACKWATER RIVER	Culvert	1979	N	N	N	7			08/30/18	City	24	40	623	Urban
HOLLAND ROAD	DRAINAGE CANAL	Culvert	1985	N	N	N	6			05/15/18	City	27	152	29928	Urban
INDIAN RIVER ROAD	DRAINAGE CANAL	Culvert	1987	N	N	N	6			05/15/18	City	53	270	14140	Urban
LONDON BRIDGE ROAD	DRAINAGE CANAL	Culvert	1996	N	N	N	7	FO		06/29/18	City	46	47	21558	Urban
LORD DUNMORE DRIVE	DRAINAGE DITCH	Culvert	1932	N	N	N	6			03/29/17	City	46	67	6155	Urban
Lynnhaven Parkway	Drainage Canal	Culvert	2010	N	N	N	7			01/24/18	City	28	153	31093	Urban
LYNNHAVEN PARKWAY	STREAM	Culvert	2016	N	N	N	8			01/12/17	City	24	100	5454	Urban
Lynnhaven Pkwy.	Green Run Drainage Canal	Culvert	1982	N	N	N	6			12/27/17	City	24	135	24938	Urban
Princess Anne Road	Tidal Stream	Culvert	1969	N	N	N	6			03/27/17	City	27	102	22422	Primary
PROVIDENCE ROAD	CEDAR HILL CANAL	Culvert	2016	N	N	N	7			05/07/18	City	25	110	20716	Urban
ROUTE 0000	Branch Wolfsnare Creek	Culvert	1979	N	N	N	6			07/17/17	City	23	90	4170	Urban
ROUTE 0000	Drainage Canal	Culvert	1974	N	N	N	6			07/26/17	City	22	121	7029	Urban
SALEM ROAD	DRAINAGE CANAL	Culvert	1980	N	N	N	6			08/31/18	City	60	35	4298	Urban
SANDBRIDGE ROAD	DRAINAGE DITCH	Culvert	1984	N	N	N	6			06/07/17	City	24	29	14161	Urban
Shore Drive	Lake Smith Spillway	Culvert	1987	N	N	N	7			09/13/17	City	27	124	25138	Primary
SOUTH BOULEVARD	OVER DRAINAGE DITCH	Culvert	1985	N	N	N	6			05/07/18	City	27	53	4249	Urban
VA.BEACH BLVD.	Trib Wolfsnare Creek	Culvert	1967	N	N	N	7			12/21/17	VDOT	32	562	27731	Primary
VA.BEACH BLVD.	Trib Wolfsnare Creek	Culvert	1967	N	N	N	6			12/21/17	VDOT	16	324	27731	Primary
WARE NECK DRIVE	NORTH LANDING RIVER	Culvert	1988	N	N	N	7			08/31/18	City	47	71	100	Urban
Wesleyan Drive	Drainage Canal	Culvert	1985	N	N	N	6			12/27/17	City	40	134	19477	Urban