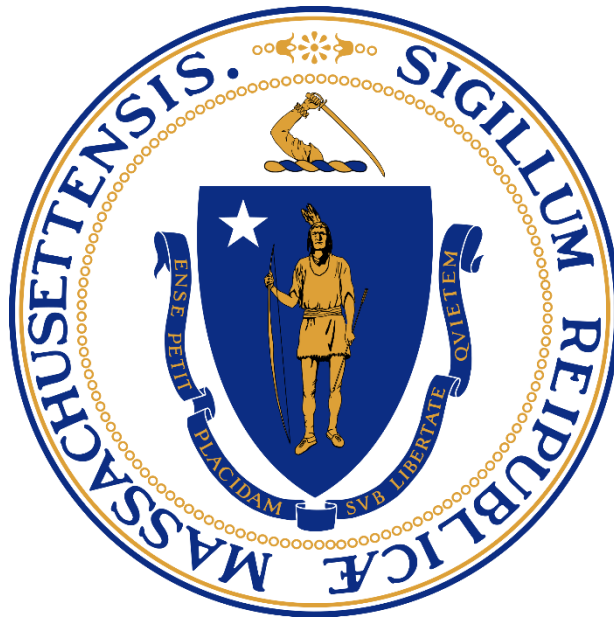


Office of Representative Steven Ultrino
33rd Middlesex District – Malden



2021 Malden Flooding Report

TABLE OF CONTENTS

Executive Summary.....	2
Areas of Concern.....	3
Timeline.....	5
Conclusions.....	6
Appendix A (Photos).....	10
Appendix B (Maps).....	15

Executive Summary

On the week of September 5, 2021, my office began to receive numerous calls from residents about severe flooding along Delta Terrace, near the Revere line, in the city of Malden. Given this flooding site's placement near multiple state-owned culverts, I immediately reached out to the Department of Conservation and Recreation (DCR) in the hopes that we could quickly identify the problem and pursue a solution together.

In the following weeks, DCR staff surveyed the site and connecting infrastructure, identifying 1) the Linden Brook Culvert and 2) dysfunctional tide gates along Rt. 1 (Town Line Brook tide gates/TLBTG) as the likely causes of the problem. DCR staff have stated repeatedly that they do not believe the Department owns or has maintenance responsibility for either the Linden Brook Culvert or the Town Line Brook Tide Gates. Rather, they have claimed that ownership and responsibility for maintenance of both structures rests either with the Mass. Department of Transportation (MassDOT), or with the City of Revere.

DCR holds that ownership and maintenance responsibilities for the Town Line Brook Tide Gates transferred to MassDOT upon the agency's creation in 2009, wherein all vehicular bridges and appurtenances belonging to DCR were transferred to the newly created agency. As the TLBTGs are structurally a part of the Cutler Highway Bridge, DCR holds that ownership and maintenance responsibilities for the tide gates were thus transferred to MassDOT along with the bridge. However, DCR simultaneously holds that maintenance responsibilities were transferred to the City of Revere following multiple authorizations to operate these tide gates under specific circumstances in late 2009.

Neither MassDOT, nor the City of Revere share DCR's understanding. The City of Revere holds that permanent ownership and maintenance responsibility for TLBTG and the Linden Brook Culvert remains with DCR, as stated clearly in their response to DCR's 2009 authorization of access and operation. Despite listing the Cutler Highway Bridge as a MassDOT owned and maintained asset in the department's public-facing GIS system, MassDOT staff stated they needed to consult further internal documentation before confirming or denying the accuracy of this information.

As of October 13, 2021, the relevant parties (Malden, Everett, Revere, DCR, MassDOT) have yet to reach a shared understanding of the ownership and maintenance of either the Town Line Brook tide gates or the Linden Brook Culvert. However, on October 14, 2021, the City of Revere proceeded to conduct emergency repairs to curb impacts from damaged tide gates. MassDOT in turn undertook further emergency repairs on October 15, 2021.

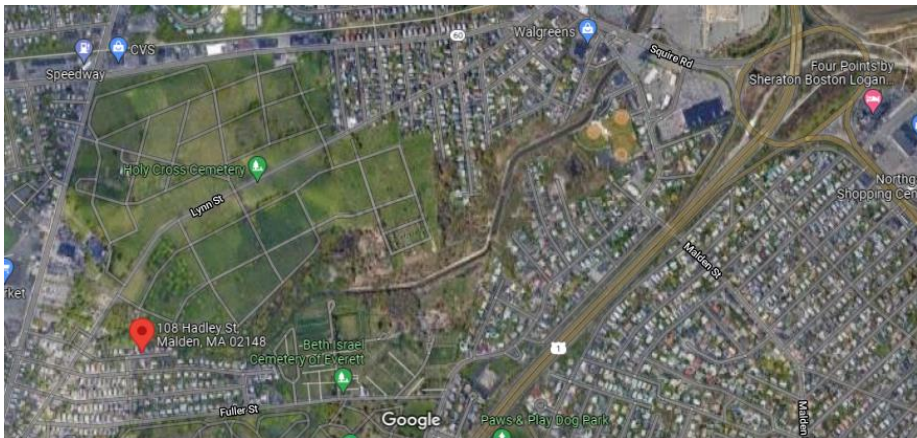
By consolidating the numerous documents, photos, videos, maps and correspondence related to these structures, I hope this report will provide insights not only into the ownership and maintenance responsibility of those structures, but also into the dire need for reform in the processes which allowed these complications to arise the first place.

Areas of Concern

Flood Site 1 - Delta Terrace. Malden



Flood Site 2 - Hadley Street, Malden



Gate Site 1 - Linden Brook Tide Gate, Revere



Gate Site 2 - Town Line Brook Tide Gate, Revere



Timeline

Unknown, 2009 – DCR Chief Engineer Noel Baratta sends a letter to Frank Strangi (Revere City Planner) granting the City of Revere “permission and all rights and privileges for access, operation, maintenance and repair for purposes of flood control and other feasible reasons,” required per permit conditions. This letter was not dated. See Appendix C, Figure 1.

Unknown, 2009 – MassDOT implements repairs on Town Line Brook tide gates. Repairs focused on floats and related equipment controlling the opening of 3 self-regulating tide gates. See Appendix C, Figure 12.

November 16, 2009 – Strangi acknowledges DCR’s authorization, but notes that while the City appreciates the permission to “access and operate the tidegates during storm events” and “under[take] any temporary emergency repairs,” the City maintains that “permanent maintenance and repairs shall fall under the responsibility of DCR as required under the original permit conditions.” See Appendix C, Figure 2

December 17, 2009 – DCR Chief Engineer Noel Baratta acknowledges 12/14/09 letter from the City of Revere and grants Revere permission to operate tide gates in the winter setting from December 1, 2009 through March 31, 2010. See Appendix C, Figure 3.

August 24, 2017 – EPA Rumney Marsh Restoration Areas map identifies: a) 1 leaking flap gate at the Linden Brook tide gate and b) 3 self-regulating tide gates not being operated per permit conditions (3 missing bottom floats). See Appendix B, Figure 1 and hyperlinked full map.

February 2020 – Malden resident Roy Watson, Esq. thanks DCR Deputy Chief Engineer Rob Lowell for recent removal of fallen trees in Town Line Brook culvert/Pine River which led to decreased drainage capacity. DCR commits to monitoring and addressing such concerns with debris in the culvert in an ongoing fashion. See Appendix C, Figure 4.

May 3, 2021 – John Ellis, General Manager of Weston and Sampson visits Rt. 1 flood gates and reports to Don Ciaramella (Chief of Infrastructure and Public Works in the City of Revere’s Water, Sewer and Drain Division) that 2 of 3 self-regulating tide gates were not functioning properly. City of Revere retains records of this communication, which cannot be included here because of proprietary information contained therein.

May 6, 2021 – Ciaramella (Revere) submits a letter to DCR requesting that they undertake regular maintenance and repairs. See Appendix C, Figure 6.

June 8, 2021 – Ciaramella (Revere) requests that DCR respond to his 05/06/21 letter requesting that DCR conduct regular maintenance on the Town Line Brook Culvert. See Appendix C, Figure 5.

June 14, 2021 – According to Commissioner Montgomery’s letter (Figure 7), DCR Engineer Tom Valton contacts City of Revere via phone to confirm that DCR is “researching response options”

and “evaluate remedies” to the problems noted in 05.03.21 letter from Ciarmella. See Appendix C, Figure 7.

June 28, 2021 – Ciaramella again requests that DCR respond to his 05.06.21 letter requesting that DCR conduct regular maintenance and repairs on the Town Line Brook Culvert. See Appendix C, Figure 5.

September 6, 2021 – Rep. Ultrino begins to receive reports of severe flooding on Delta Terrace in Malden. Rep. Ultrino emails Craig Cashman, DCR Director of Gov’t Affairs, and Dan Fielding, MassDOT Legislative Liaison. See Appendix C, Figure 8 for full email, Appendix A, Flood Site 1 for attached photos.

September 10, 2021 – Rep. Ultrino receives word via phone from DCR, noting that staff had visited the Town Line Brook tide gates and reported no dysfunction. Rep. Ultrino, the same day, receives word via phone from the City of Revere that staff had visited and identified at least one dysfunctional tide gate.

September 14, 2021 – DCR staff sends letter from Commissioner Montgomery dated 09.10.21 informing Revere that “DCR will continue its due diligence to locate prior authorizations, commitments, or obligations for maintenance to the Town Line Brook channel.” See Appendix C, Figure 7.

September 23, 2021 – DCR, MassDOT, and City of Malden officials and staff meet with Rep. Ultrino and staff at Delta Terrace to survey flooding on-site. DCR identifies the area’s problem culvert as Linden Brook culvert, notes Rt.1 tide gates not functioning properly. DCR, MassDOT commit to resolving questions of ownership and maintenance responsibility ASAP. DCR commits to beginning process of culvert assessment to ascertain need for dredging.

September 30, 2021 – Rep. Ultrino, having heard no updates, sends reminder to MassDOT, DCR staff on-site at 9.23.21 meeting, sends reminder of next-step commitments made by meeting attendees, including further research compiled by staff. See Appendix C, Figure 9.

October 6, 2021 – Rep. Ultrino, again having heard no updates from MassDOT or DCR, send another reminder to site-visit attendees and other Department staff involved. Ultrino presents maps found in DCR and DOT GIS systems which indicate infrastructure ownership, asks if these clarify confusion, and asks what further information is needed. See Appendix C, Figure 9.

October 8, 2021 – Rep. Ultrino again follows up with MassDOT and DCR to ask for updates on next-steps to which they committed on 9.23.21. See Appendix C, Figure 10.

October 13, 2021 – Malden and Revere City staff and officials meet alongside Reps Ultrino and Giannino to discuss next steps. Malden Ward 8 Councilor Jadeane Sica raises flooding concerns on Hadley Street in Malden as potentially connected to Town Line Brook tide gate malfunction. The Town Line Culvert directly abuts Hadley Street and residents observed tidal flooding patterns similar to those observed at Delta Terrace by both residents and DCR staff.

October 13, 2021 – MassDOT conducts a site visit with District 4 drainage contractor. Findings include: Town Line Brook self-regulating tide gate #2 is listing due to a broken hinge; self-regulating tide gate #3 is fully detached and lying submerged downstream. See Appendix C, Figure 12.

October 14, 2021 – MassDOT commits to emergency action repair as they plan with DCR and City of Revere to conduct permanent repairs. Emergency action repair expected before weekend of 10.16.21. See Appendix C, Figure 12.

October 14, 2021 – City of Revere Water and Sewer staff conduct emergency action repair. See last photo in Appendix A, Gate Site 1.

Findings

1. In November 2009, DCR granted the City of Revere “permission [to operate the Town Line Brook tide gates] and all rights and privileges for access, operation, maintenance and repair for purposes of flood control and other feasible reasons.” However, in their response to this authorization, the City of Revere made clear that “permanent maintenance and repairs shall fall under the responsibility of DCR as required under the original permit conditions.” Following this authorization, another authorization for “wintertime operation” was issued to the City of Revere in December 2009 by DCR. This suggests that DCR owned and managed these tide gates at least until December of 2009. Otherwise, such authorization would have to have been issued by another authority (the owner). See Appendix C, Figure 1.
2. In 2017, EPA scientists identified damaged or dysfunctional infrastructure at both the Linden Brook tide gate and the Town Line Brook tide gates. The malfunctions noted in this map are relatively consistent with recently observed malfunctions of these gates. Given this consistency of these observations in all but the increasing severity of damage over time, we can reasonably conclude that the deterioration of the culverts which led to current flooding began in or before 2017. See Appendix A, Figure 1 for 2017 EPA Map.
3. In February 2020, Malden resident Roy Watson requested that DCR remove debris from a section of the Town Line Brook Culvert/Pine River. DCR did so and committed to monitoring and addressing the accumulation of debris in the culvert in an ongoing fashion. This response seems to confirm that DCR is, at least in part, responsible for the maintenance of this culvert. Otherwise, this removal and commitment to future maintenance lacks justification. This incident and response also suggest that DCR was aware of the need for additional maintenance on the Town Line Brook culvert at least as early as February 2020, assuming they were not made aware of the above-mentioned 2017 EPA map’s damage report. See Appendix C, Figure 4.
4. Flooding at Delta Terrace and Hadley Street began in late-August to early-September following severe storm events. However, further inundations after these storm events followed the tidal cycle, rising and falling with the tide. As a result, all involved parties concluded that these floods were caused by failed drainage infrastructure allowing sea water to surcharge through inland drains.

5. Failed drainage infrastructure contributing to flooding includes:
- a. (2) dysfunctional self-regulating tide gates at the Town Line Bridge tide gates adjacent to Rt. 1 in Revere. Both tide gates' vent pipes sunk below mid-tide water levels, allowing significant amounts of water to bypass tide gates (identified 5.3.21 by John Ellis of Weston & Sampson on behalf of the City of Revere).
 - b. (2) dysfunctional timber tide gate at the Town Line Bridge tide gates. One gate has a sheared hinge, preventing total gate closure and allowing in significantly higher volumes of water. The other tide gate completely sheared from both hinges, floating downstream (identified by City of Revere staff on multiple occasions).
 - c. (1) dysfunctional solar control panel. The panel powered sensors for the opening and closing of tide gates but was non-operational upon inspection. (identified 5.3.21 by John Ellis of Weston & Sampson on behalf of the City of Revere).
6. The City of Revere and the City of Malden, based on past correspondence and past experience with maintenance, both believe maintenance responsibility for the Linden Brook Culvert, the Town Line Brook Culvert, the Linden Brook tide gates, and the Town Line Brook tide gates rest with either DCR or MassDOT.
7. DCR maintains that they neither own, nor hold maintenance responsibility for the aforementioned structures. DCR staff have indicated that ownership and maintenance responsibility are retained by the City of Revere and/or MassDOT. These conclusions are irreconcilable. However, in the absence of further information from DCR, reconciliation of these conflicting conclusions was not possible.
8. DCR GIS systems indicates that the land surrounding the Town Line Brook culvert, as well as the Linden Brook tide gate are owned and maintained by DCR. (See Appendix B, Figure 3)
9. MassDOT maintains that DCR retains ownership and maintenance responsibility for the aforementioned structures.
10. MassDOT GIS systems indicate that the Town Line Brook tide gates, which form part of the Cutler Highway Bridge, are a MassDOT asset. This system also indicates that multiple culvert structures along the path of the Linden Brook culvert are MassDOT assets. (See Appendix B, Figure 4)
11. Temporary emergency repairs have been made by the City of Revere. However, permanent repairs are still needed. DOT has committed to undertake these repairs working with DCR and the City of Revere.

12. Further collaboration is still needed between DCR and DOT to determine the ownership and maintenance responsibility of the Town Line Brook Culvert, the Linden Brook Culvert, and their respective tide gates.

Acknowledgements

It has truly taken many hands to reach the comprehensive understanding of the causes and impacts of recent flooding in Malden, as well as the understanding of ownership and maintenance responsibility for contributing infrastructure reflected in this report.

I would particularly like to thank the local and state officials and staff who went above and beyond to get to the bottom of these issues, many of whom contributed significant time to solving this problem despite its impact lying outside of their district and/or realm of responsibility.

State Officials and Staff:

Sen. Jason Lewis

Rep. Jessica Giannino

Rep. Paul Donato

Emily Granoff, District Director, Sen. Lewis

Matt Walsh, Legislative Aide, Rep. Ultrino

Local Officials and Staff:

Malden Mayor Gary Christenson

Revere Mayor Brian Arrigo

Malden Ward 8 Councilor Jadeane Sica

Bob Knox, Malden Director of Public Works

John Desantis, Malden Water Supervisor

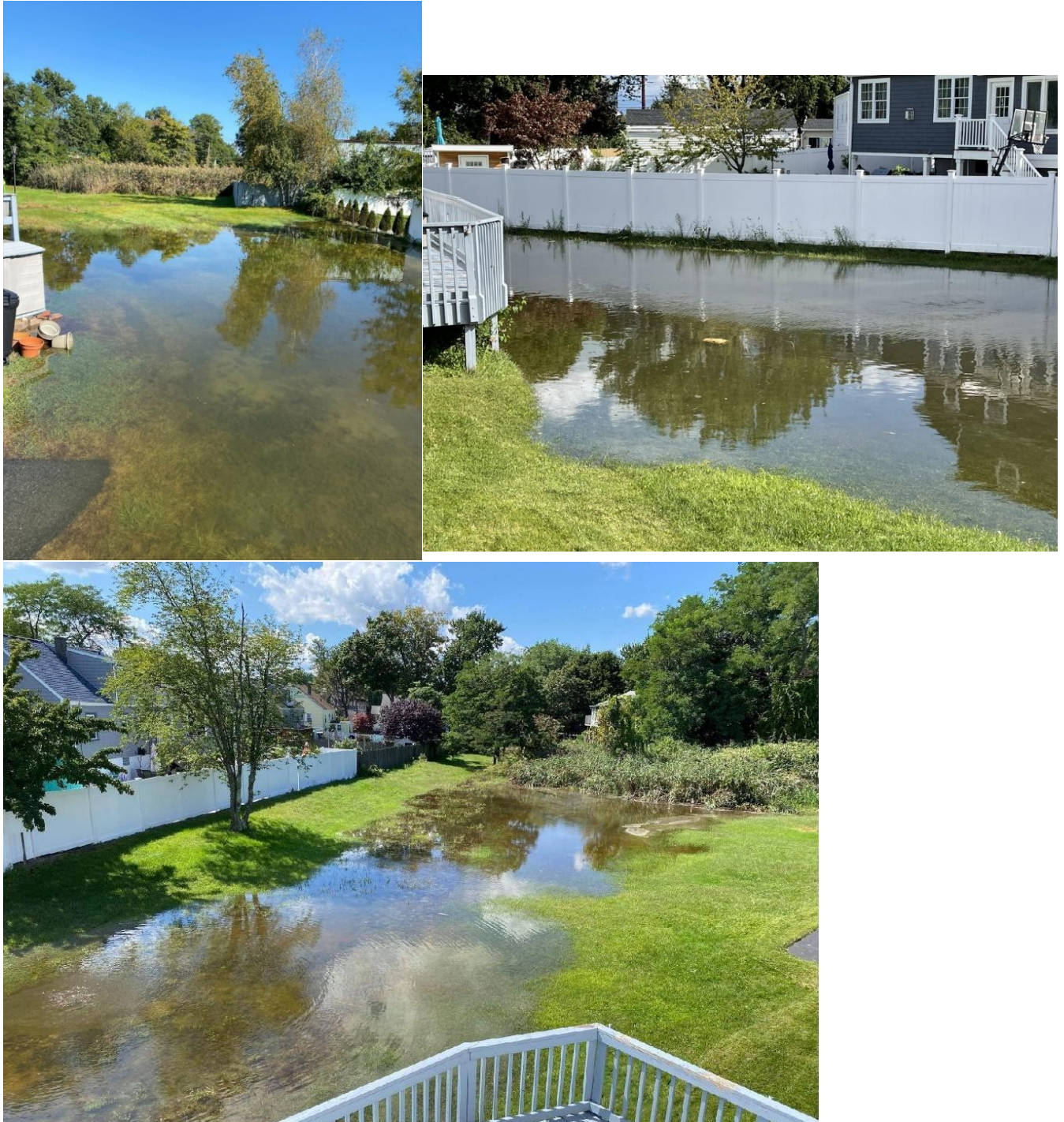
City of Malden Water Department and Department of Public Works Staff

Don Ciaramella, Revere Chief of Infrastructure and Public Works

City of Revere Water and Sewer staff

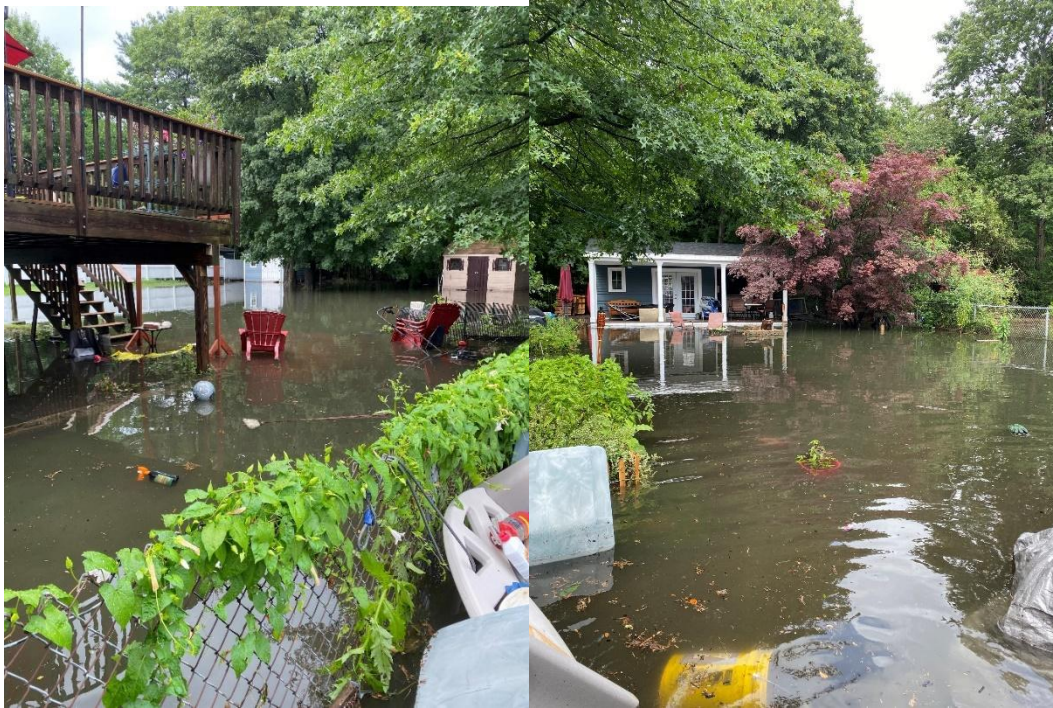
Appendix A – Site Photos + Video

Flood Site 1 – Delta Terrace



[Click here](#) for video of Linden Brook Culvert's drop inlet surcharging during high tide.

Flood Site 2 – Hadley Street



Gate Site 1 – Town Line Brook tide gates





[Click here](#) for video of leaking tide gates at Town Line Brook tide gates

ABOVE IMAGES AND VIDEO OF TOWN LINE BROOK TIDE GATES TAKEN BEFORE 10.14.21
EMERGENCY REPAIR COMPLETED BY CITY OF REVERE, BELOW IMAGE TAKEN AFTER.



Gate Site 2 – Linden Brook tide gate



NB: The Linden Brook tide gate is a simple flap gate. The flap gate can be seen through the surrounding brush in the red circled area. Better pictures weren't possible when Ultrino staff visited without significant impact on Marshlands.

Appendix B – Maps

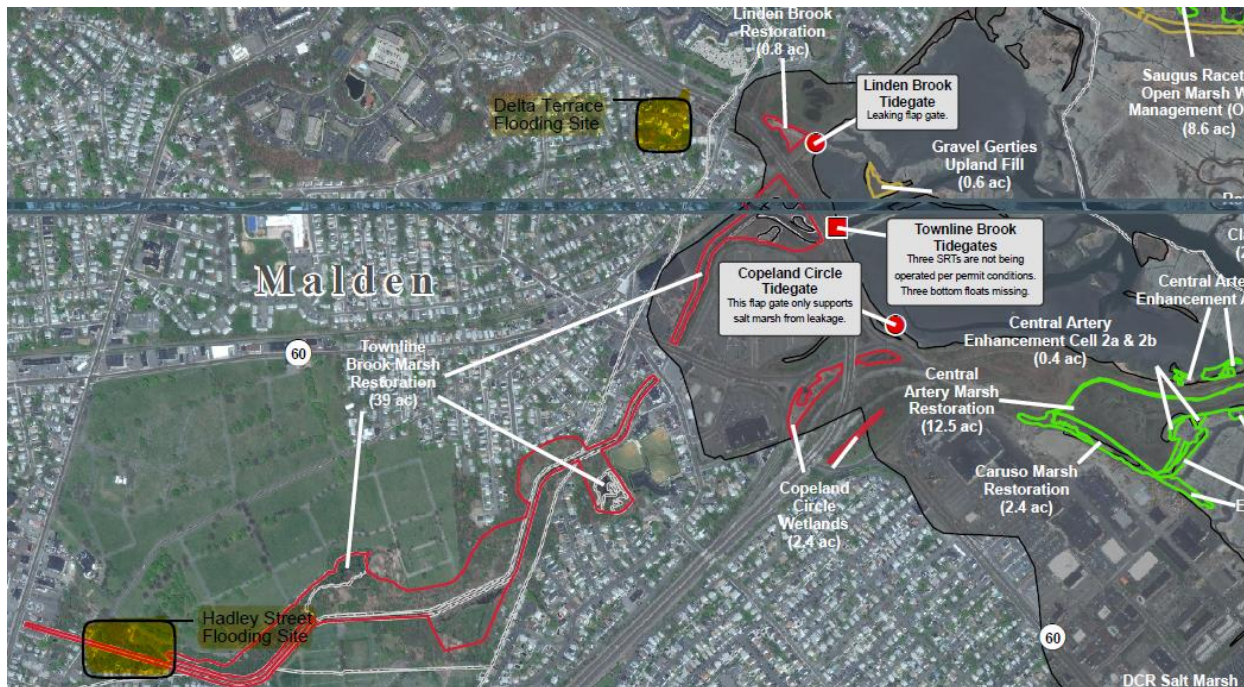


Figure 1 – Map of Rumney Marsh Restoration Area, EPA, August 24, 2017. Full unmarked map available online [here](#).

NB: This map indicates that the Linden Brook tide gate and the Townline Brook tide gates have been in disrepair since 2017. In the case of the Townline Brook tide gates, the EPA found that this disrepair led to a violation of the gates' permit conditions. In the absence of any claims or evidence of recent repair, we can reasonably conclude that no repairs have been made since identification of these problems 4 years ago.

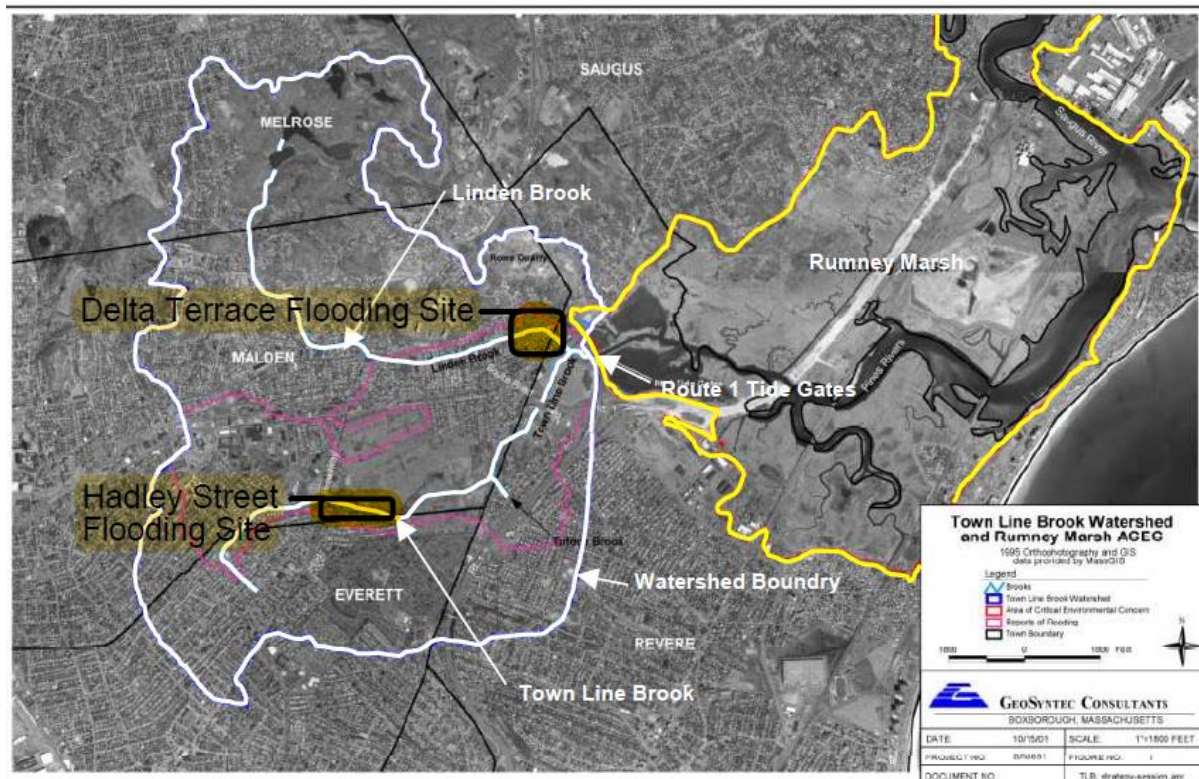


Figure 2 – Map of Linden Brook and Town Line Brook culverts and watersheds, GeoSyntec Consultants (Quigley, Roy, and Gill) Town Line Brook Urban Watershed Study Modeling Incremental Improvements, 2002. Full study and unmarked map available [here](#).

NB: Both flooding sites border state-owned culverts.

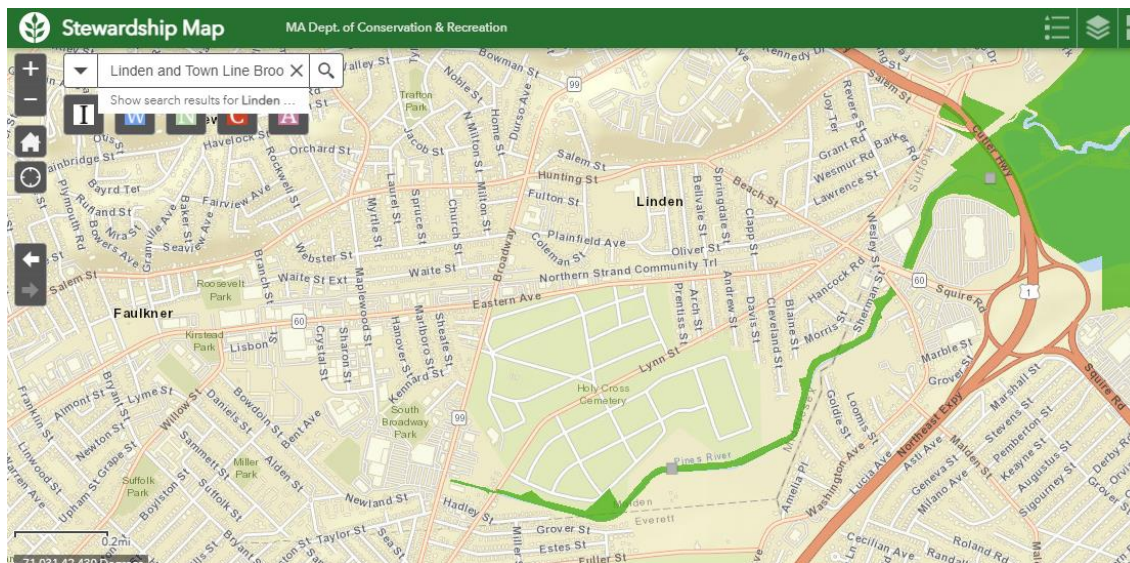


Figure 3 – DCR’s Stewardship Map, which indicates ownership and maintenance of land surrounding the Town Line Brook by virtue of listing the space as “DCRS Owned and Managed Land. View full map [here](#)

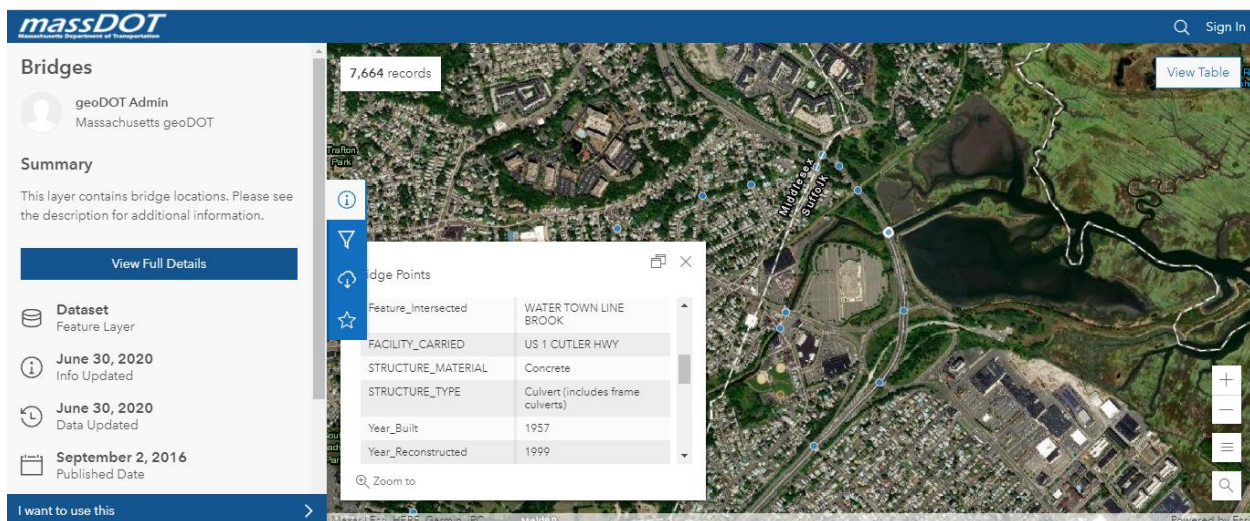


Figure 4 – MassDOT’s Bridge inventory tool in GIS, which indicates that ownership and maintenance of the Cutler Highway Bridge rest with MassDOT, specifically including frame culverts in the asset description. Other culverts along the path of the Linden Brook Culvert are also marked as MassDOT assets on the map. View full map [here](#).