

Dixie Mall Development

Shadow Study

SCREO I Dixie Outlet Mall Inc.

December 16, 2022

Purpose of the Shadow Study

A Shadow Study is required in support of this development application dated December 16, 2022. The study was conducted in accordance with the City of Mississauga's Urban Design Terms of Reference for Shadow Studies (TOR) dated June 2014. The shadow study TOR requires development proponents to meet five criteria for the dates of June 21, September 21, and December 21. This Shadow Study provides general findings that will be refined as the process progresses into the detailed design phase.

The lands known collectively as the Dixie Mall Development are under ownership by SCREO I Dixie Outlet Mall Inc. (Slate). The subject site municipally known as 1250 South Service Road is bounded by South Service Road to the north, the Dixie Outlet Mall to the east, a residential neighbourhood fronting onto Myron Drive to the south, and Haig Boulevard to the west. The geographic coordinate location of the site is latitude: 43.594200 and longitude: -79.570720.

The origin/source of the base plan was downloaded from the City of Mississauga's website. Astronomic north was determined by using the base plan downloaded from the City and measured with Autodesk Revit, a Computer Aided Design software.

The following are the five criteria required in a City of Mississauga shadow study:

Criteria 3.1: Ensure adequate sunlight on residential private outdoor amenity spaces

This criterion is met if there is shadow impact for no more than two consecutive hourly test times within the space between the exterior wall of the dwelling that abuts the amenity space and the line of impact assessment on June 21 and September 21.

Criteria 3.2: Ensure adequate sunlight on communal outdoor amenity areas including, children's play areas, school yards, tot lots, and park features such as sandboxes, wading pools etc., and outdoor amenity areas used by seniors and those associated with commercial and employment areas during spring, summer, fall and winter.

This criterion, which applies to public amenity areas that are part of the proposed development, is met if the sun access factor is at least 50% or 0.5 on June 21, September 21, and December 21.

Criteria 3.3: Ensure adequate sunlight on the public realm including sidewalks, open spaces, parks and plazas to maximize their use during the shoulder seasons (spring and fall).

This criterion is met if there is no incremental shade from the proposed development at 9:12 a.m., 10:12 a.m. and 11:12 a.m., and at 3:12 p.m., 4:12 p.m. and 5:12 p.m. on low and medium density residential streets; at 12:12 p.m., 1:12 p.m. and 2:12 p.m., and three consecutive times either 9:12 a.m., 10:12 a.m. and 11:12 a.m. or 3:12 p.m., 4:12 p.m. and 5:12 p.m. on mixed-use, commercial, employment, and high-density residential streets; and provides a sun access factor of at least 50% on public open spaces, parks and plazas on September 21.

Criteria 3.4: Ensure adequate sunlight on turf and flower gardens in public parks.

This criterion is met if full sun is provided on any 7 test times on September 21, from 1.5 hours after sunrise to 1.5 hours before sunset.

Criteria 3.5: Ensure adequate sunlight on building faces to allow for the possibility of using solar energy.

This criterion is met if there is shadow impact for no more than two consecutive hourly test times in the "No Impact Zone" i.e. the space between the front, rear and exterior side walls of the adjacent low-rise residential buildings and the respective lines of impact assessment.

The following written analysis and shadow drawings are to address criteria 3.1 and 3.5.

The drawings on pages 5-7 show a summary of the properties affected by shadows on each of the test dates, followed by the detailed shadow drawings for the required dates and times per the City of Mississauga TOR (pages 8-43). Shadow impact is shown using coloured dots to indicate impacted properties: green dots signify the property has been shadowed for a single test time, yellow dots signify the property is shadowed for the period of two test times, and red dots signify the property is shadowed for more than two test times and that the criterion is not met for that specific property.

Criteria 3.1: Ensure adequate sunlight on residential private outdoor amenity spaces

This criterion is met if there is shadow impact for no more than two consecutive hourly test times within the space between the exterior wall of the dwelling that abuts the amenity space and the line of impact assessment on June 21 and September 21.

Shadows produced by the proposed development meet this criterion for a majority of the residential private outdoor amenity spaces surrounding the site.

On September 21, the criterion is met except for a single property fronting the QEW in Applewood Acres is shadowed in the morning for just under 2 hours from 8:35 a.m. to 10:12 a.m. and not shadowed from that time onwards. On June 21, the criterion is met except for two properties in the Lakeview neighbourhood that are shadowed for just over 1 hour from 7:07 a.m. to 8:20 a.m. and not shadowed from that time onwards. On December 21, the criterion is met except for nine properties near or fronting the QEW in Applewood Acres that are shadowed in the morning until 12:17 p.m., but are not shadowed from that time onwards. All other properties are not impacted by the development shadows.

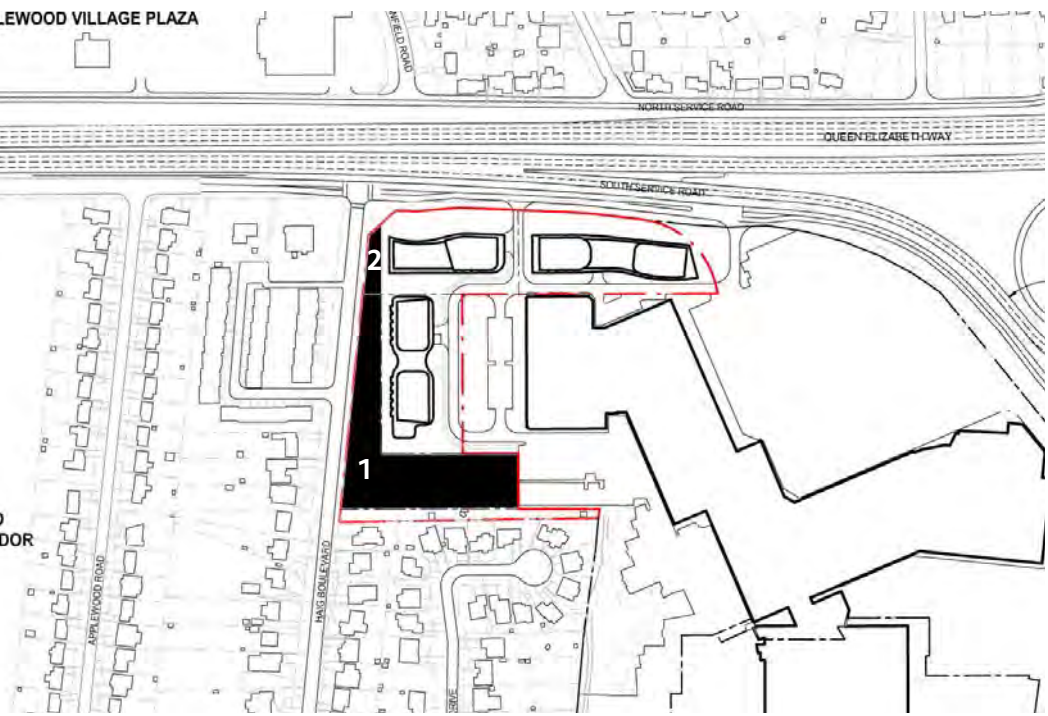
Further detailed design will be required to determine the exact location of private residential outdoor space and appropriate measures will be taken to minimize shadows.

Criteria 3.5: Ensure adequate sunlight on building faces to allow for the possibility of using solar energy.

This criterion is met if there is shadow impact for no more than two consecutive hourly test times in the “No Impact Zone” i.e. the space between the front, rear and exterior side walls of the adjacent low-rise residential buildings and the respective lines of impact assessment.

As mentioned in Criteria 3.1, the majority of adjacent properties are not impacted by the proposed development shadows. On September 21, a single property is impacted by shadows for just under two hours until 10:12 a.m. and is in full sun for the rest of the day. On June 21, two properties are impacted by shadows until 8:20 a.m. and then in full sun for the rest of the day. On December 21, nine properties are impacted by shadows from the proposed development in the morning until 12:17 p.m., and then are in full sun for the rest of the day. All other adjacent low-rise residential buildings meet this criterion.

The following written analysis and shadow drawings (pages 44-55) are to address criteria 3.2, 3.3, and 3.4.



- 1 Neighbourhood Park
Sun Access Factor
94.2% (September)
- 2 POPS
Sun Access Factor
81.8% (September)

Criteria 3.2: Ensure adequate sunlight on communal outdoor amenity areas including, children’s play areas, school yards, tot lots, and park features such as sandboxes, wading pools etc., and outdoor amenity areas used by seniors and those associated with commercial and employment areas during spring, summer, fall and winter.

This criterion, which applies to public amenity areas that are part of the proposed development, is met if the sun access factor is at least 50% or 0.5 on June 21, September 21, and December 21.

Given the early stage of design, it is premature to calculate whether or not this criterion is satisfied. Through detailed design of the development blocks, open spaces and specific location of park features will be determined and appropriate measures will be taken to minimize shadows and calculate the exact sun access factors. With that in mind, the buildings have been massed and located strategically to avoid undue shadow impacts on all proposed open spaces. The objective of the ultimate massing form is to create comfortable environments, alleviate unfavorable conditions and take appropriate measures to minimize shadows.

Criteria 3.3: Ensure adequate sunlight on the public realm including sidewalks, open spaces, parks and plazas to maximize their use during the shoulder seasons (spring and fall).

This criterion is met if there is no incremental shade from the proposed development at 9:12 a.m., 10:12a.m. and 11:12 a.m., and at 3:12 p.m., 4:12 p.m. and 5:12 p.m. on low and medium density residential streets; at 12:12 p.m., 1:12 p.m. and 2:12 p.m., and three consecutive times either 9:12 a.m., 10:12 a.m. and 11:12 a.m. or 3:12 p.m., 4:12 p.m. and 5:12 p.m. on mixed use, commercial, employment, and high density residential streets; and provides a sun access factor of at least 50% on public open spaces, parks and plazas on September 21.

The shadow study diagrams demonstrate that the criterion has been met for incremental shade from the proposed development on low and medium density residential streets. The shadow study diagrams also demonstrate that the proposed built form results in minimal shadow impact on the proposed park. On September 21, the Neighbourhood Park remains free of shadow from 10:12 a.m. until 4:12 p.m. Minimal shadowing occurs in the morning at the north end of the proposed park and in the evening on the south east leg of the proposed park. At no point during September 21 is the Neighbourhood park more than 50% shadowed, resulting in a sun access factor well above the required 50%. The POPS remains free of shadow from 10:12 a.m. to 5:12 p.m.

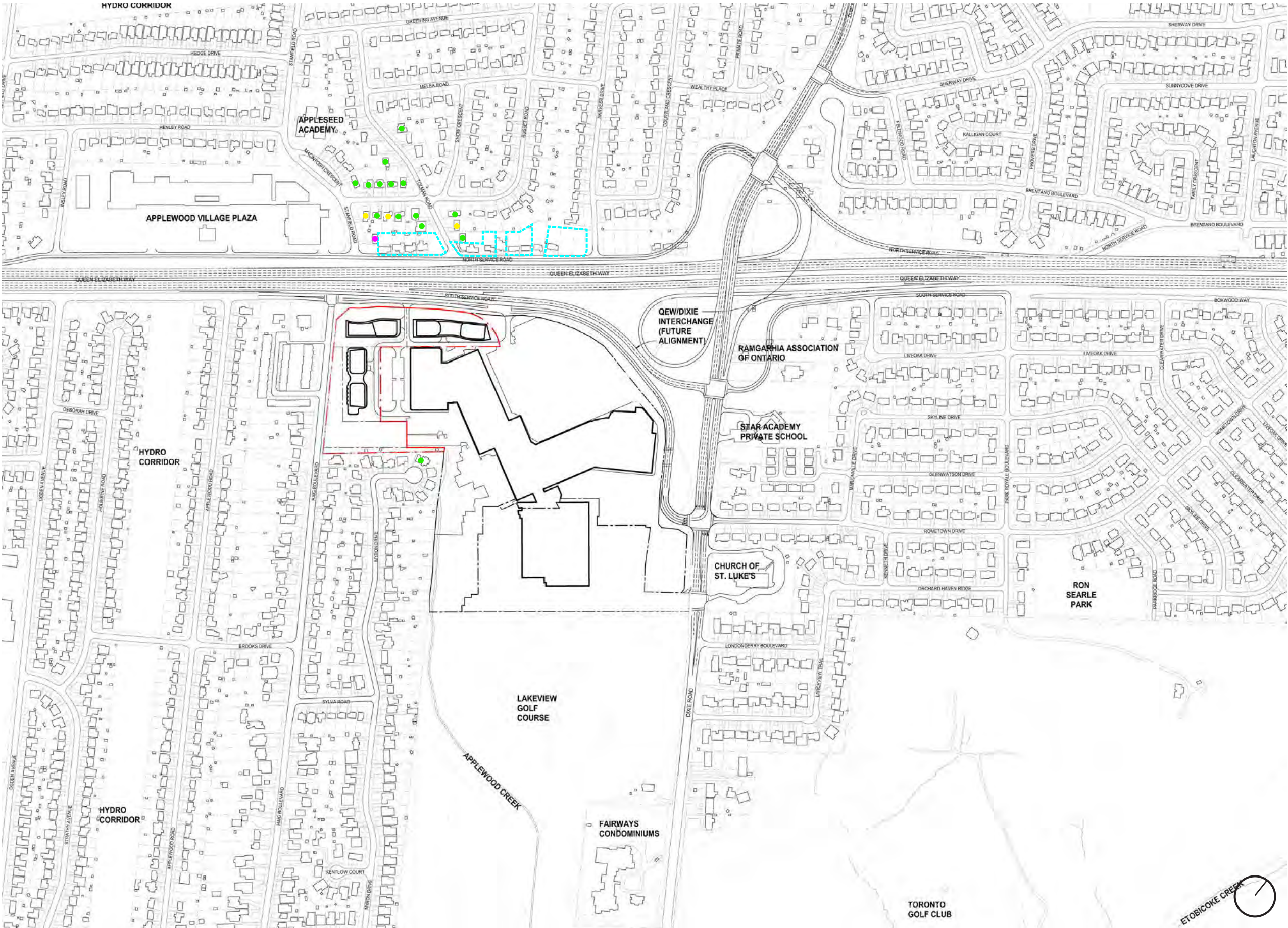
Criteria 3.4: Ensure adequate sunlight on turf and flower gardens in public parks.

This criterion is met if full sun is provided on any 7 test times on September 21, from 1.5 hours after sunrise to 1.5 hours before sunset.

As mentioned in Criteria 3.3 above, the Neighbourhood Park is minimally shadowed at the northern edge in the morning and at the south eastern edge in the evening, but throughout the day, each portion receives full sun for 7 test times throughout the day. The POPS receives full sun for 8 test times throughout the day. Due to the early stage of the proposed master plan concept, specific turf and planting bed locations have not been confirmed, but as the design progresses, the analysis will be refined and remain conscious of sun exposure for public park spaces. The ultimate programming and design of the public parks will be completed by the City of Mississauga.

March/Sept 21

All Impacts

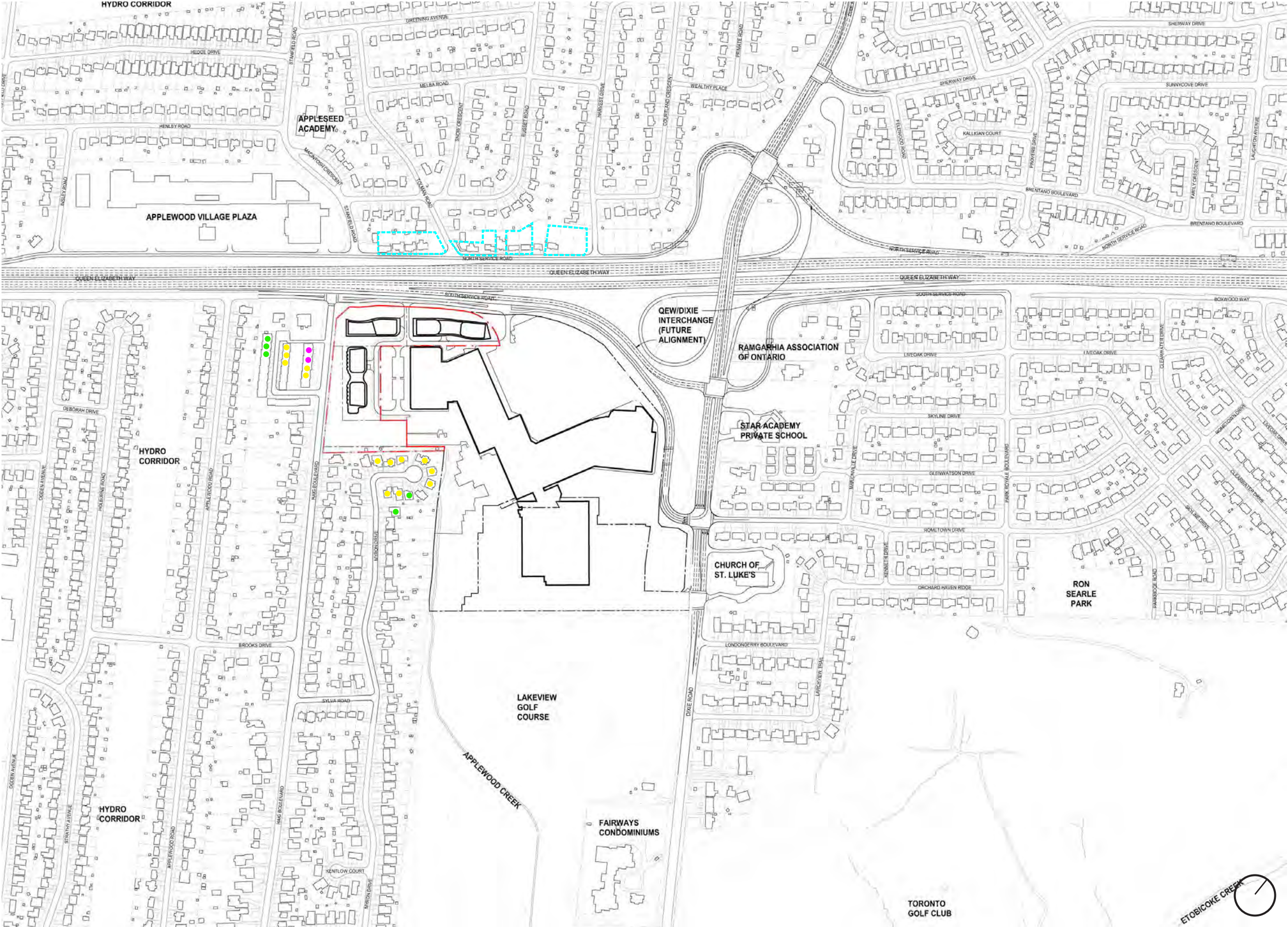


Legend

- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

All Impacts

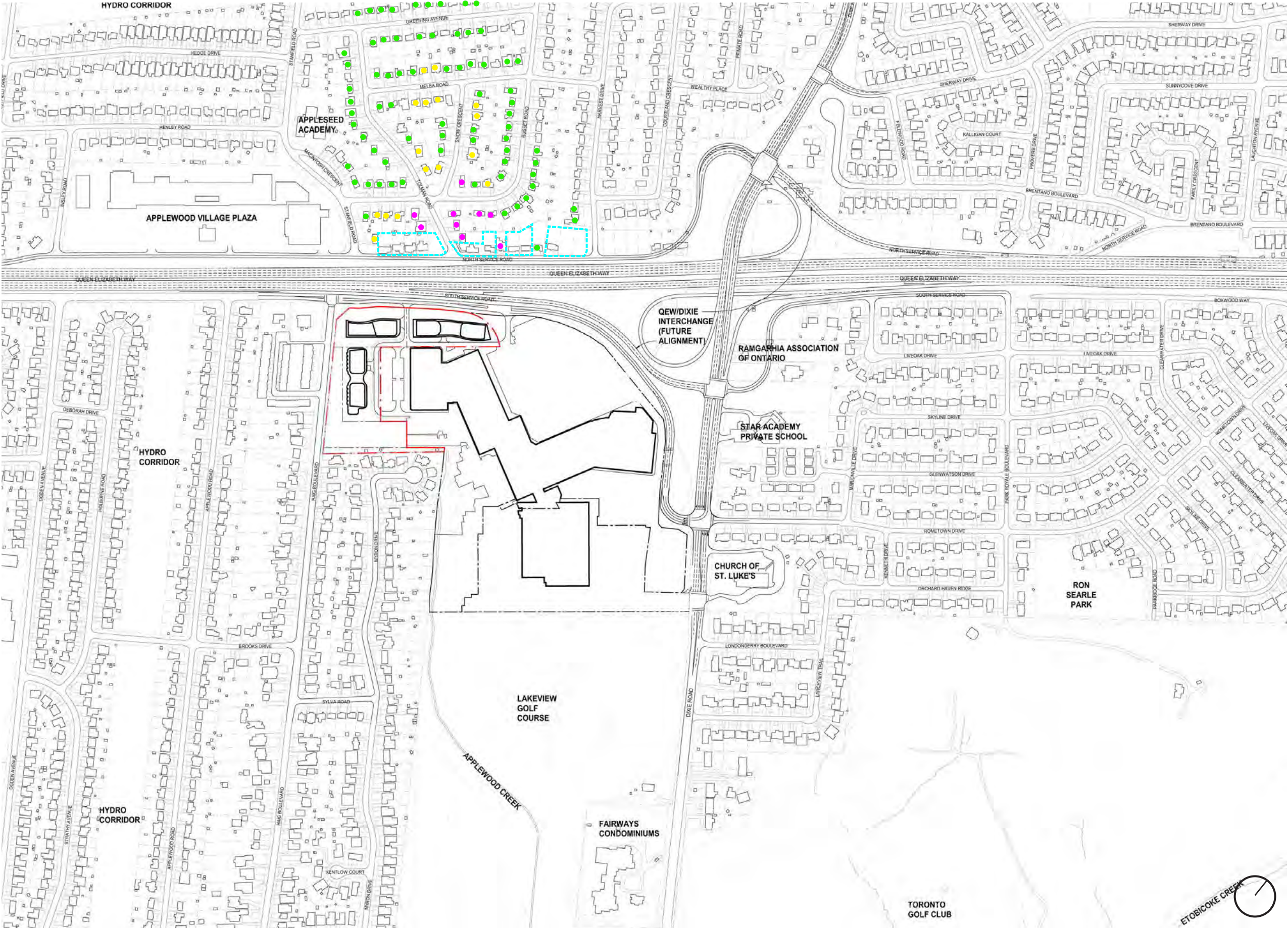


Legend

- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

December 21

All Impacts



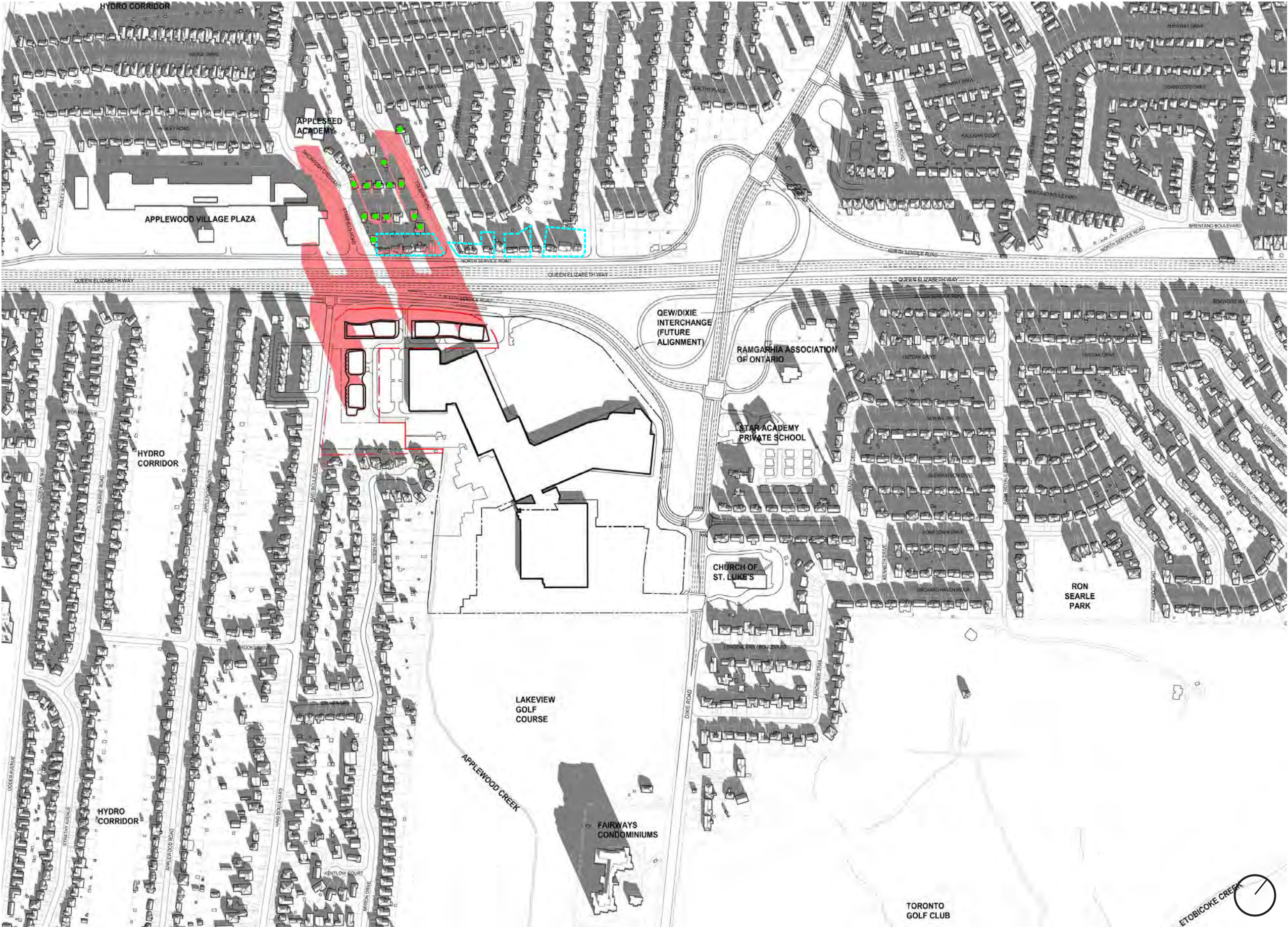
Legend

- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

**MARCH &
SEPTEMBER 21**

March 21/
September 21

8:35



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

9:12



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

10:12

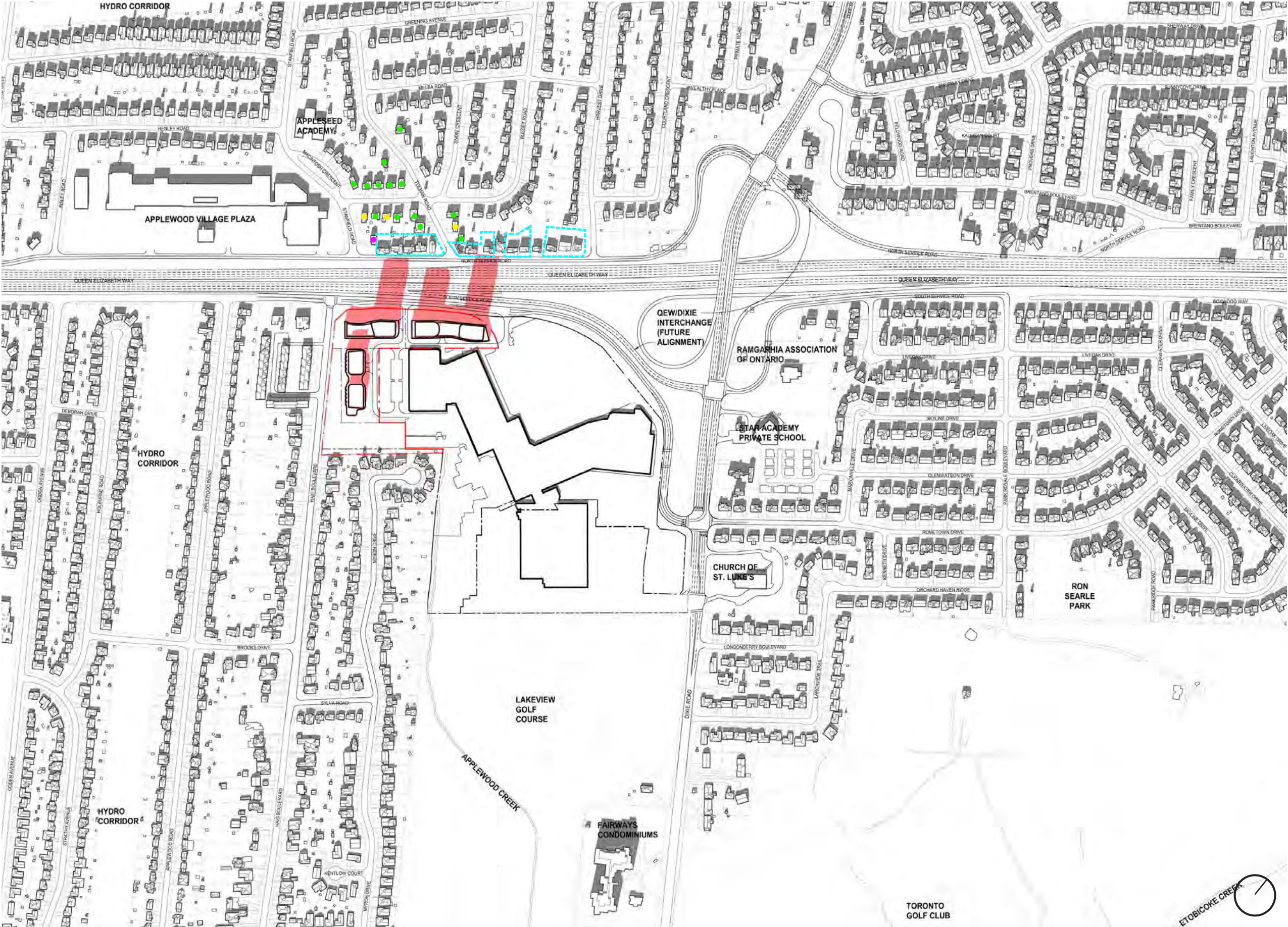


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

11:12



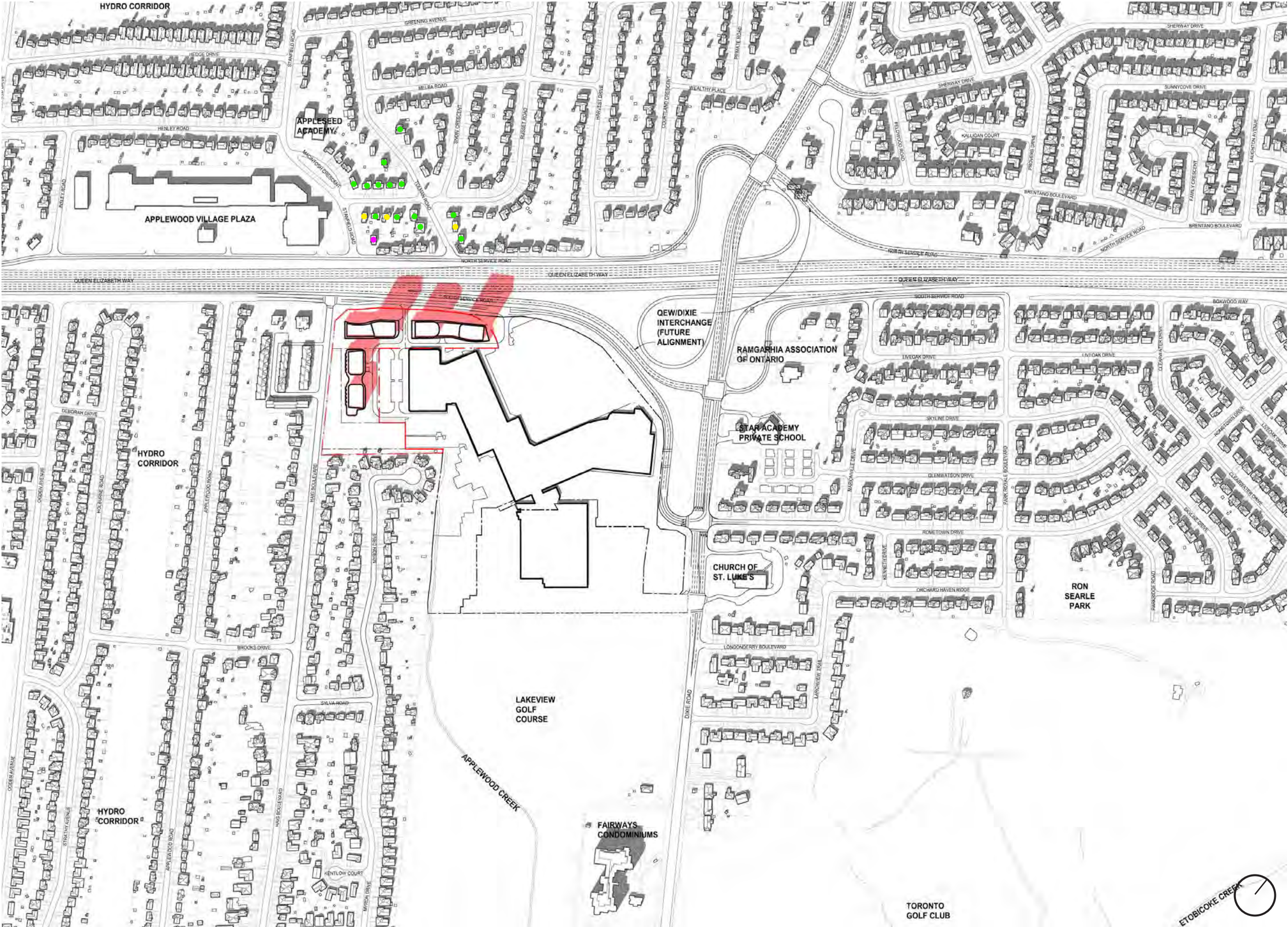
Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

12:12



Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

13:12



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

14:12



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

15:12

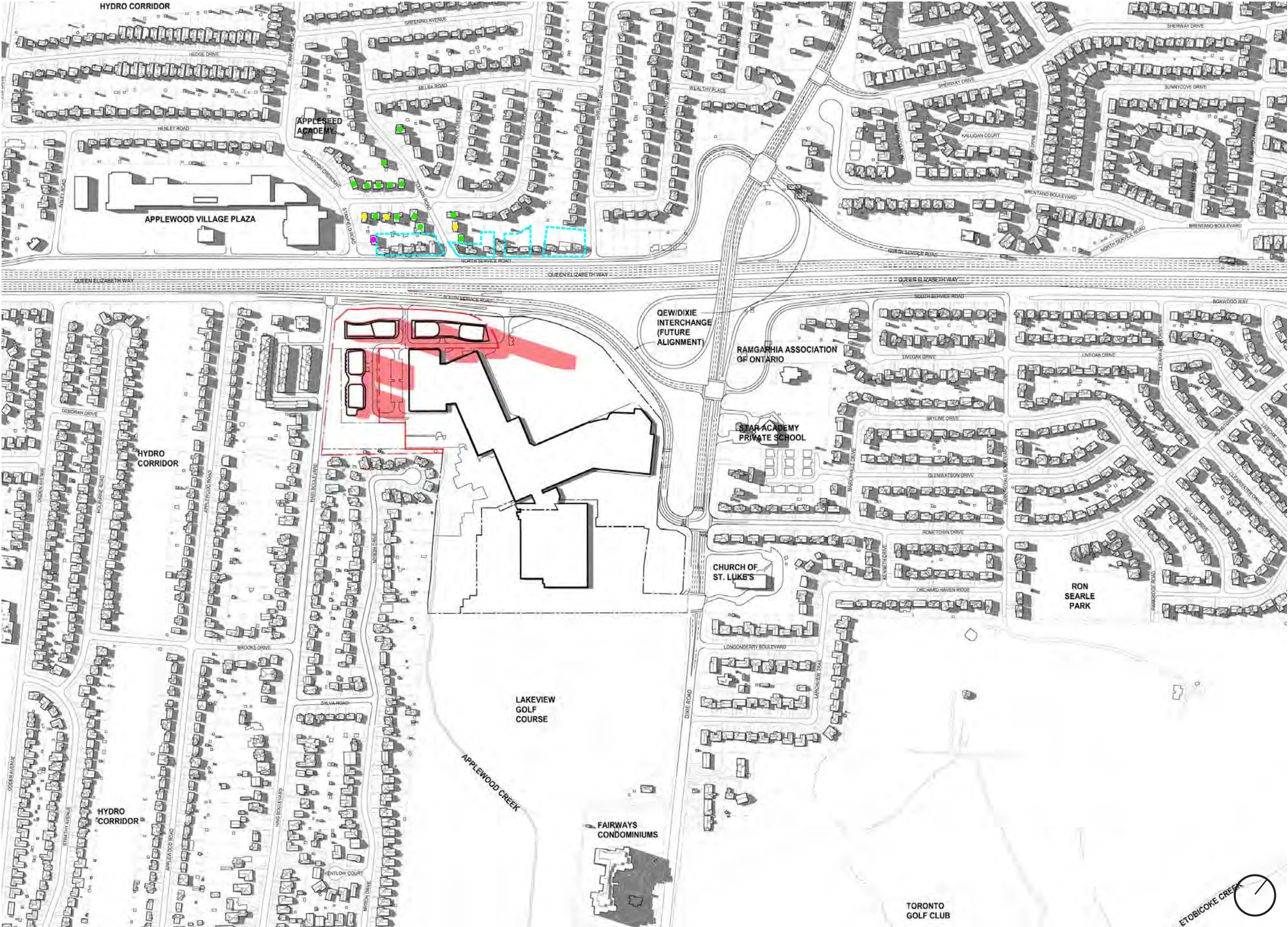


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

16:12



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

17:12

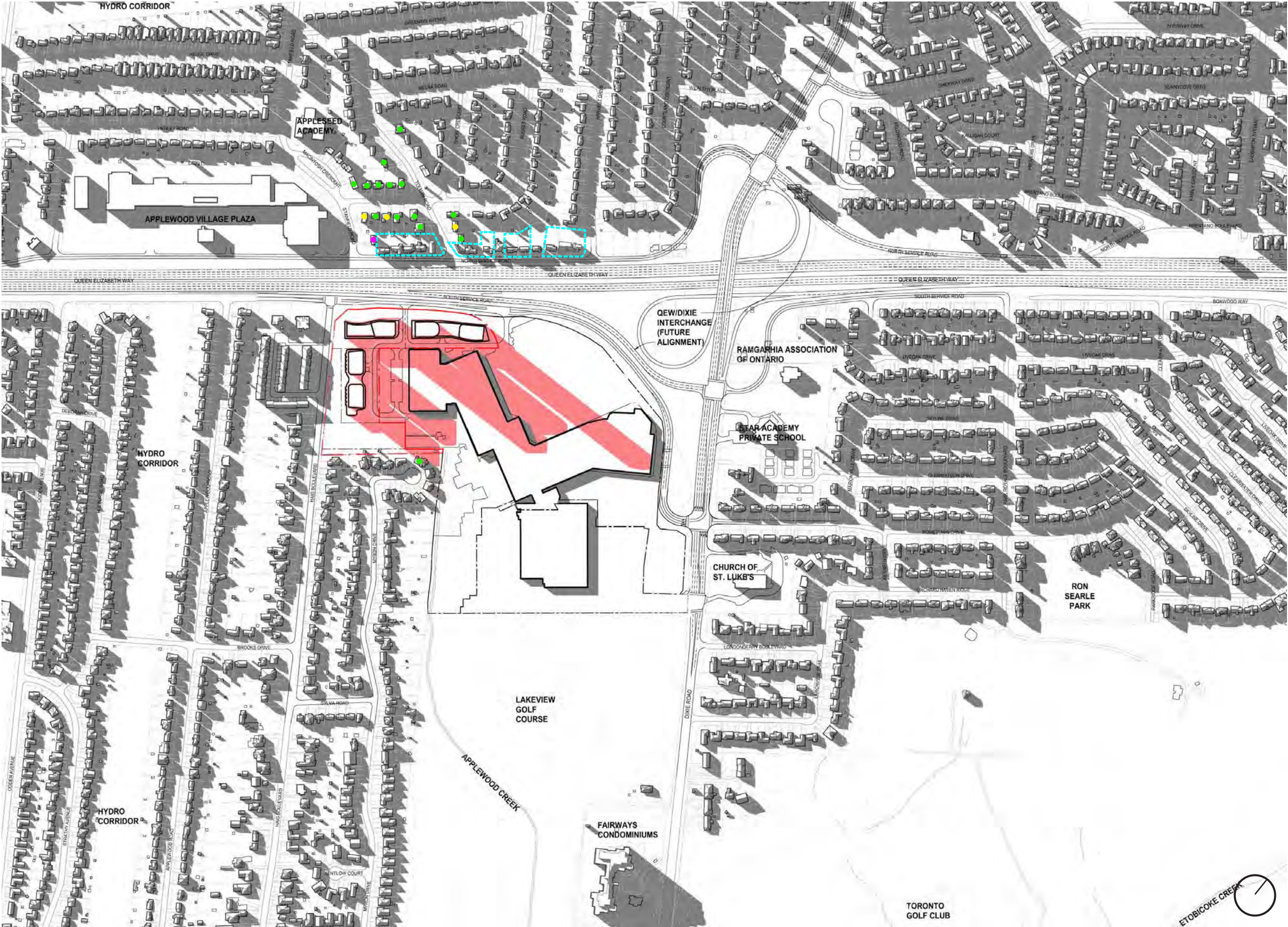


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

March 21/
September 21

17:48

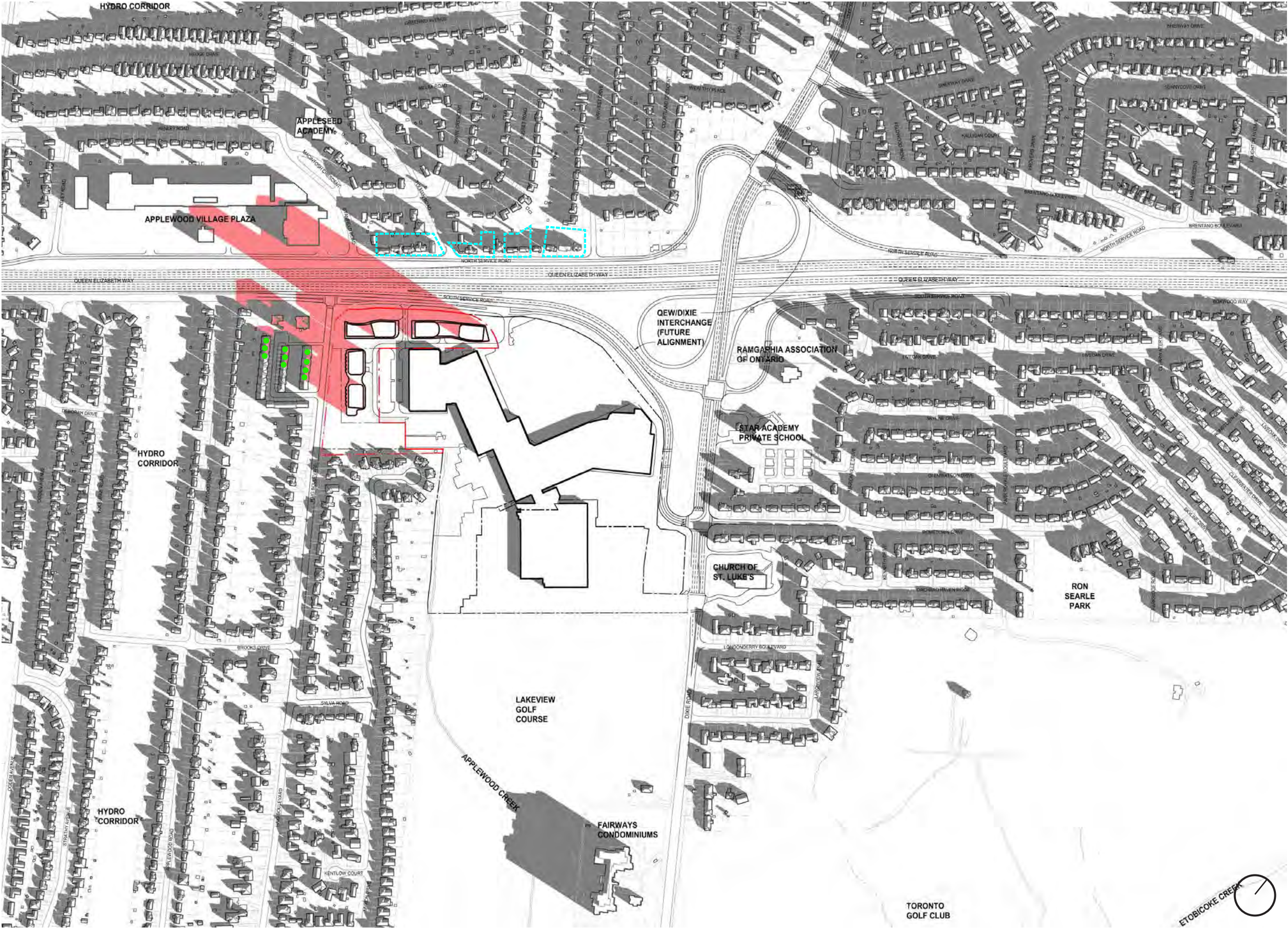


Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

JUNE 21



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

7:20



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

8:20



Legend








- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

9:20










Legend

-  Existing Shadows
-  Proposed Shadows
-  Shadow Impact / 1 test time
-  Shadow Impact / 2 test times
-  Shadow Impact / 3 test times
-  Vacant Properties
-  Site Boundary

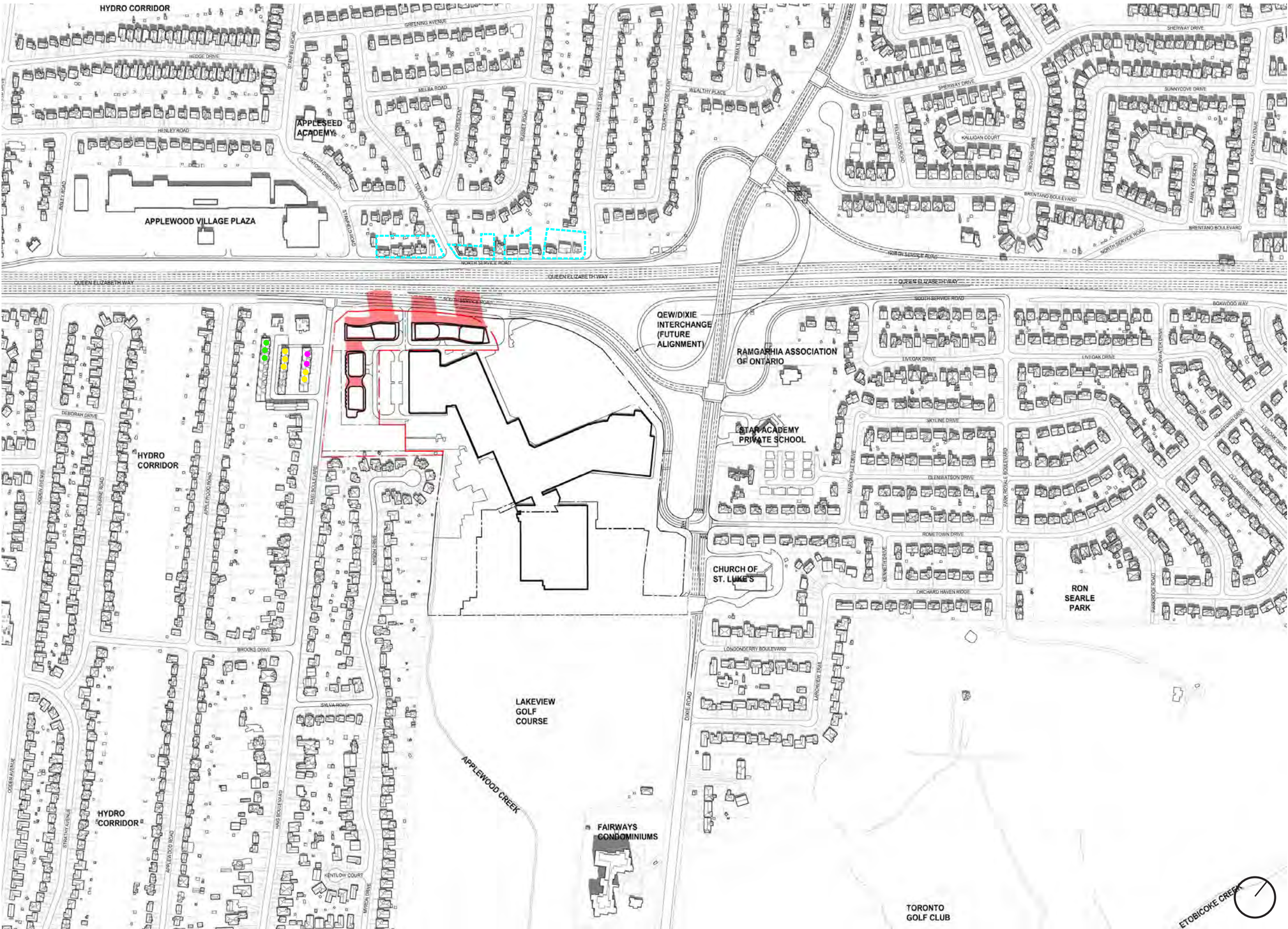
10:20



-  Existing Shadows
-  Proposed Shadows
-  Shadow Impact / 1 test time
-  Shadow Impact / 2 test times
-  Shadow Impact / 3 test times
-  Vacant Properties
-  Site Boundary

June 21

11:20

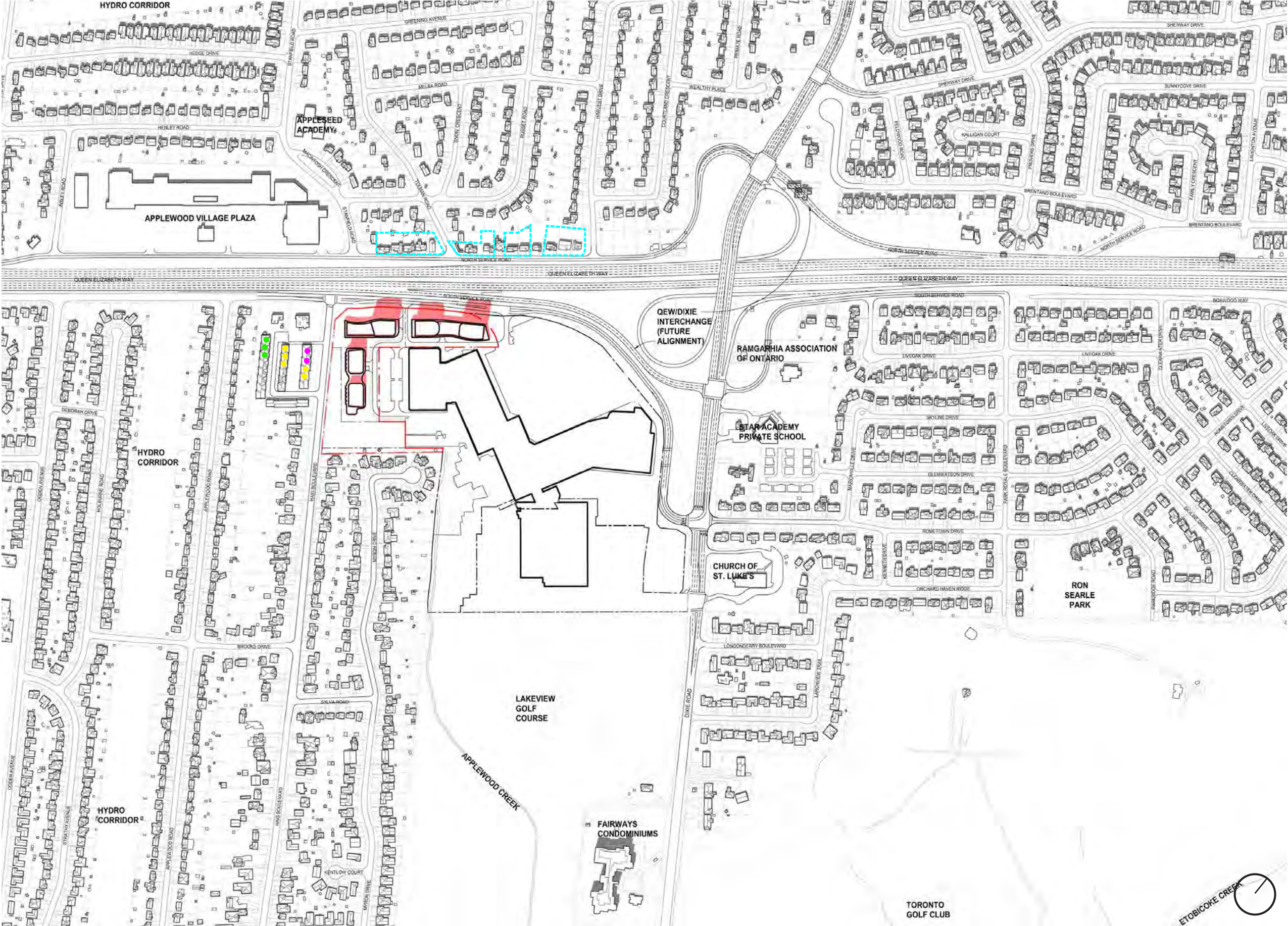


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

12:20










Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

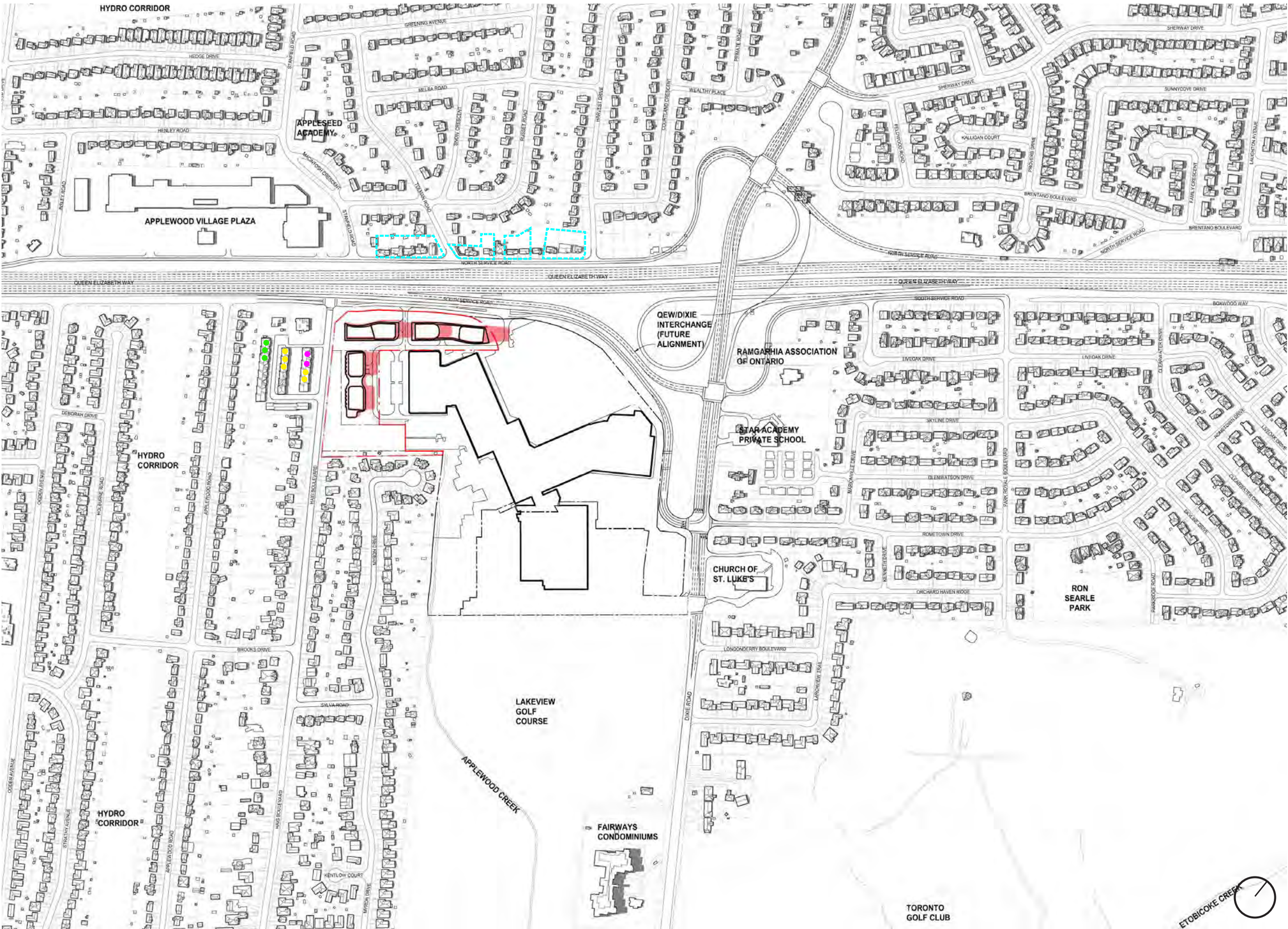
13:20



-  Existing Shadows
-  Proposed Shadows
-  Shadow Impact / 1 test time
-  Shadow Impact / 2 test times
-  Shadow Impact / 3 test times
-  Vacant Properties
-  Site Boundary

June 21

14:20



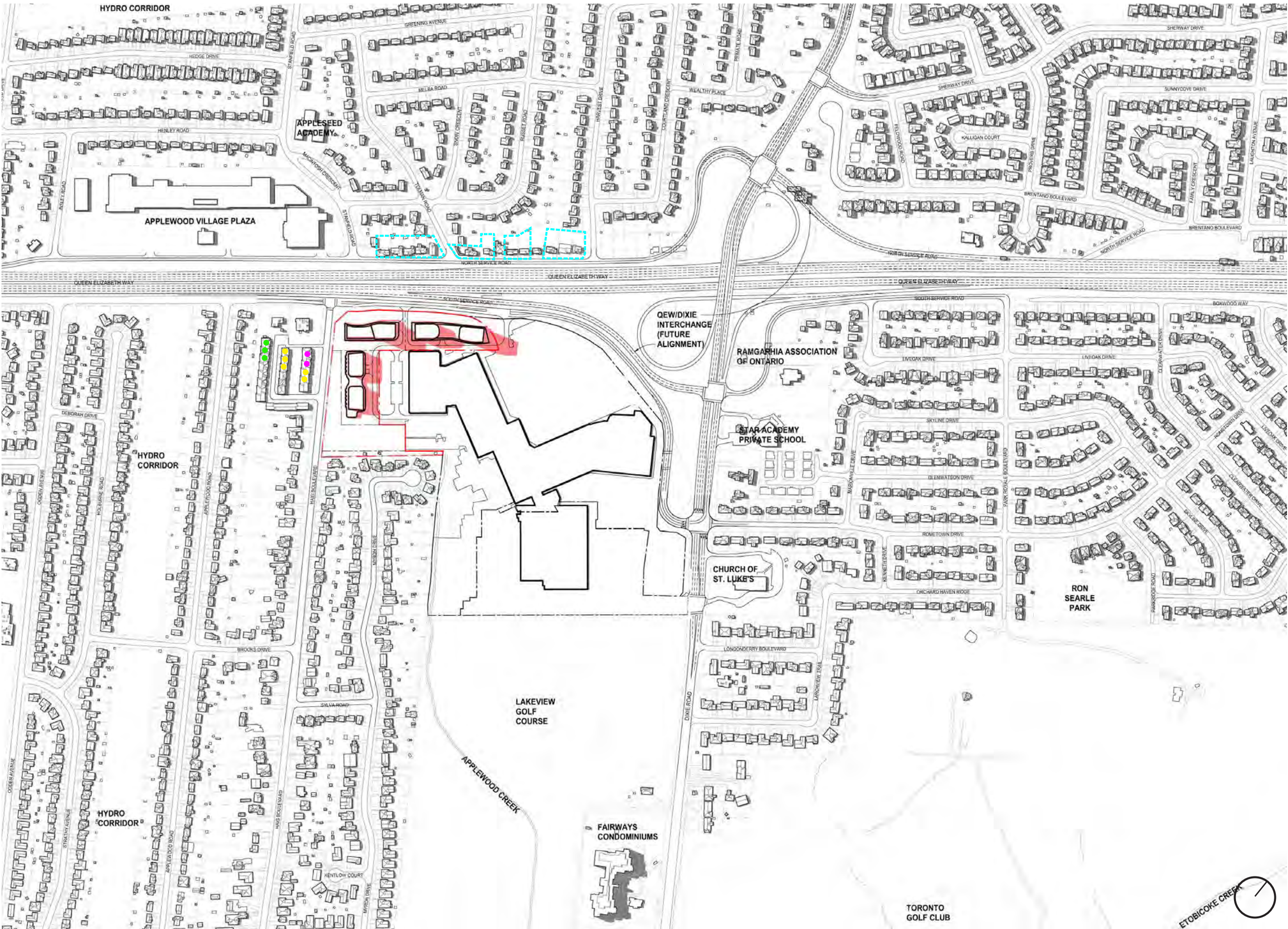
Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

15:20



Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

16:20



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

17:20



Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

18:20

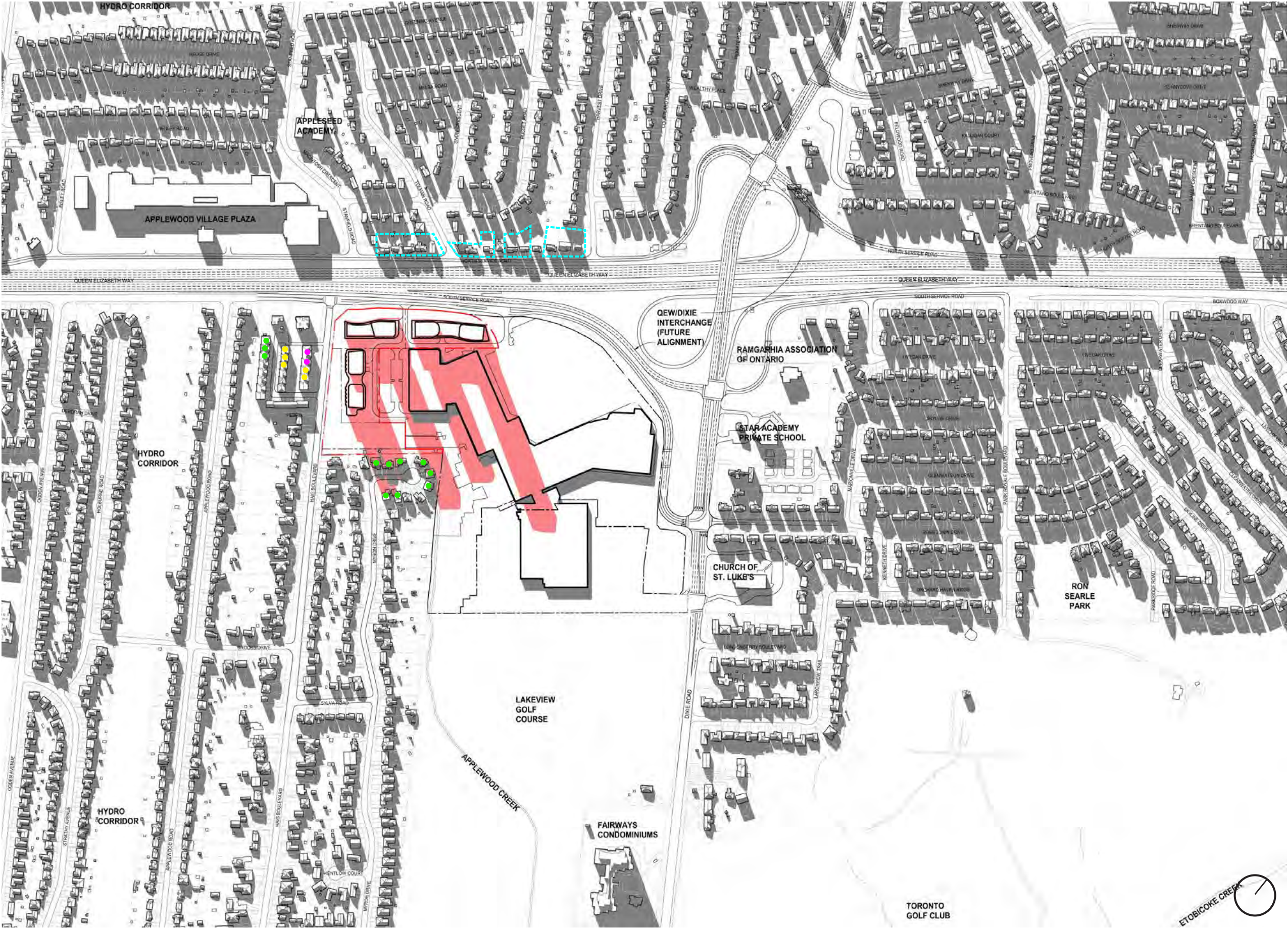


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

19:20

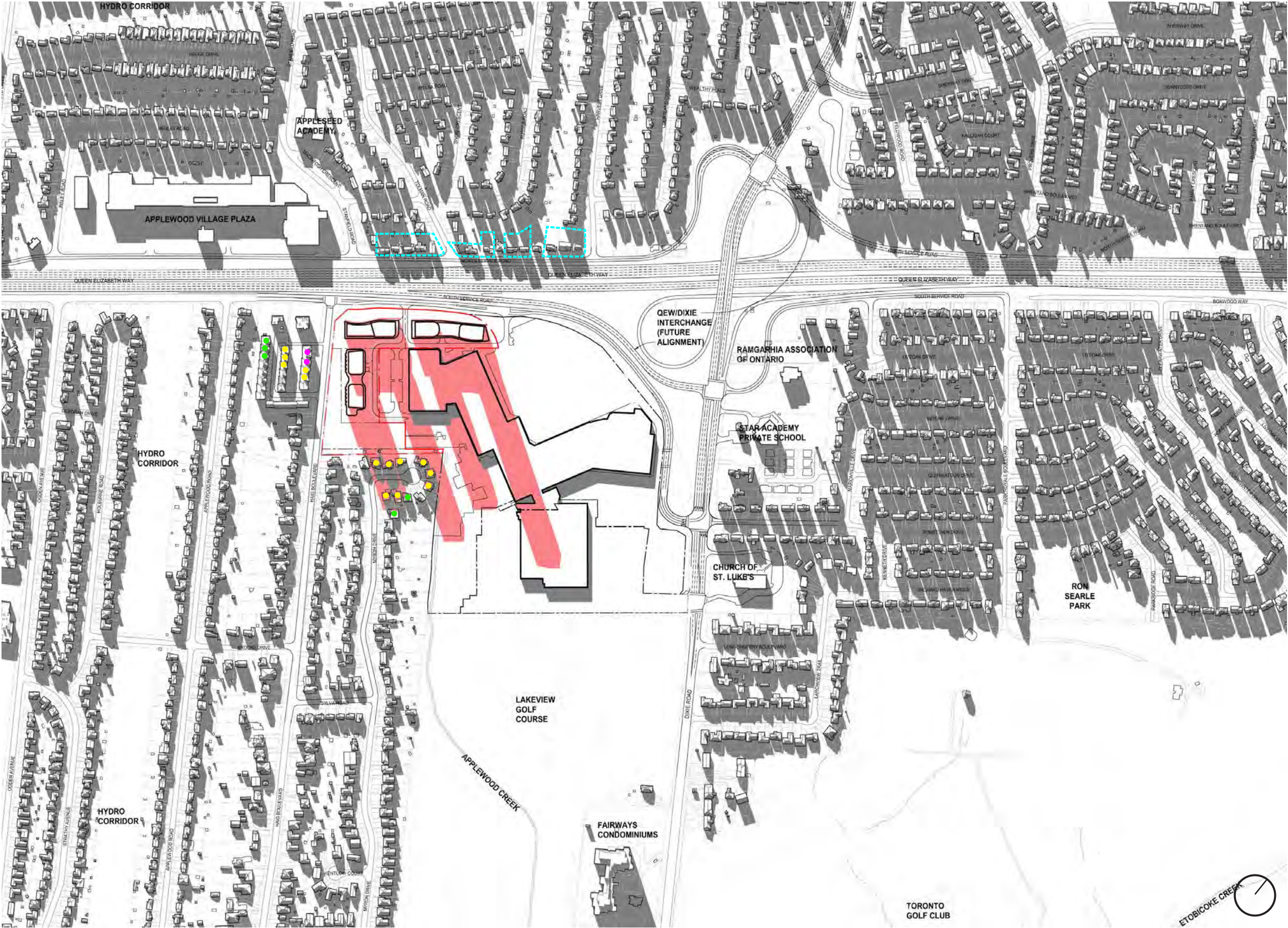


Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

June 21

19:33



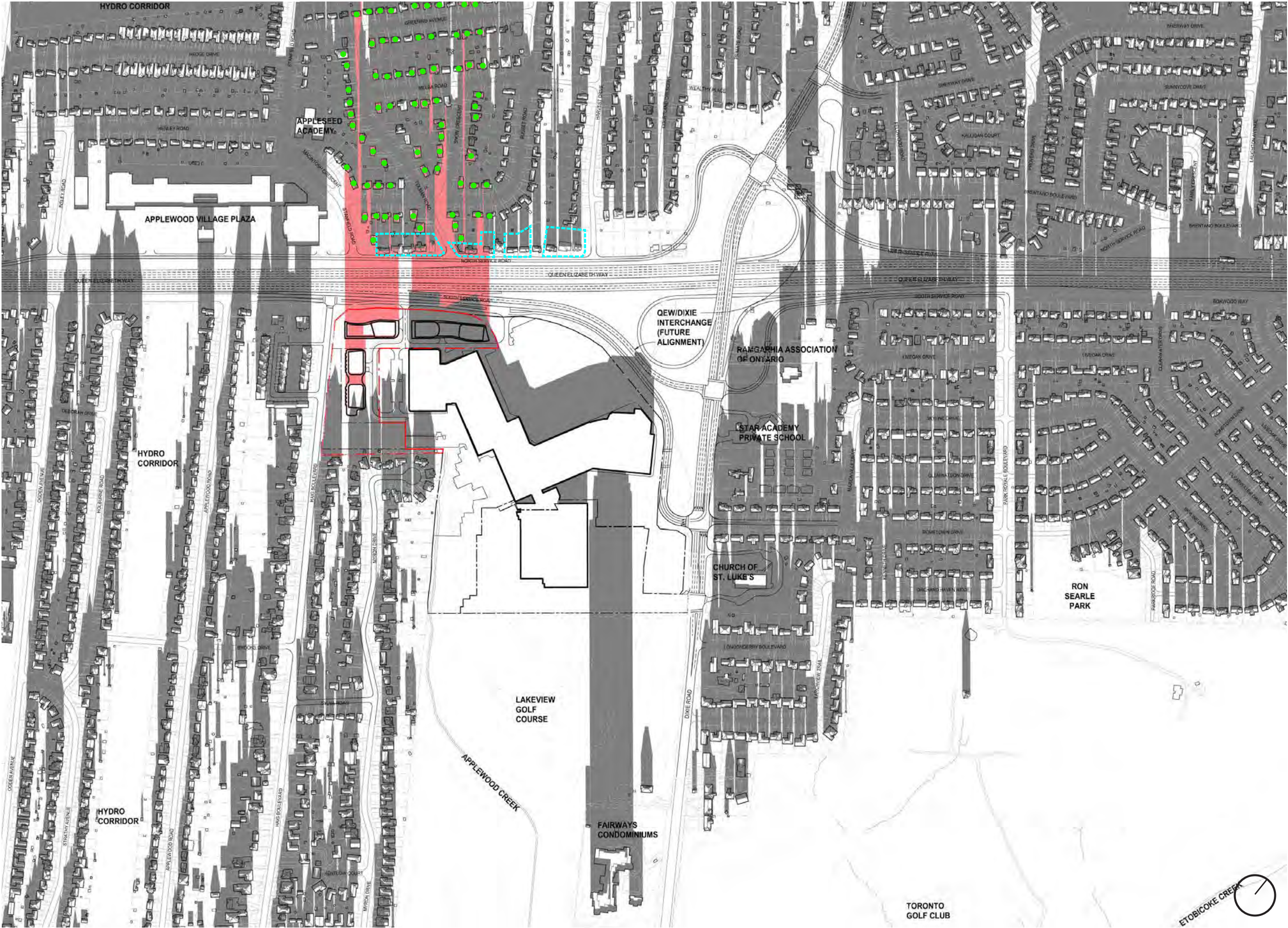
Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

DECEMBER 21

December 21

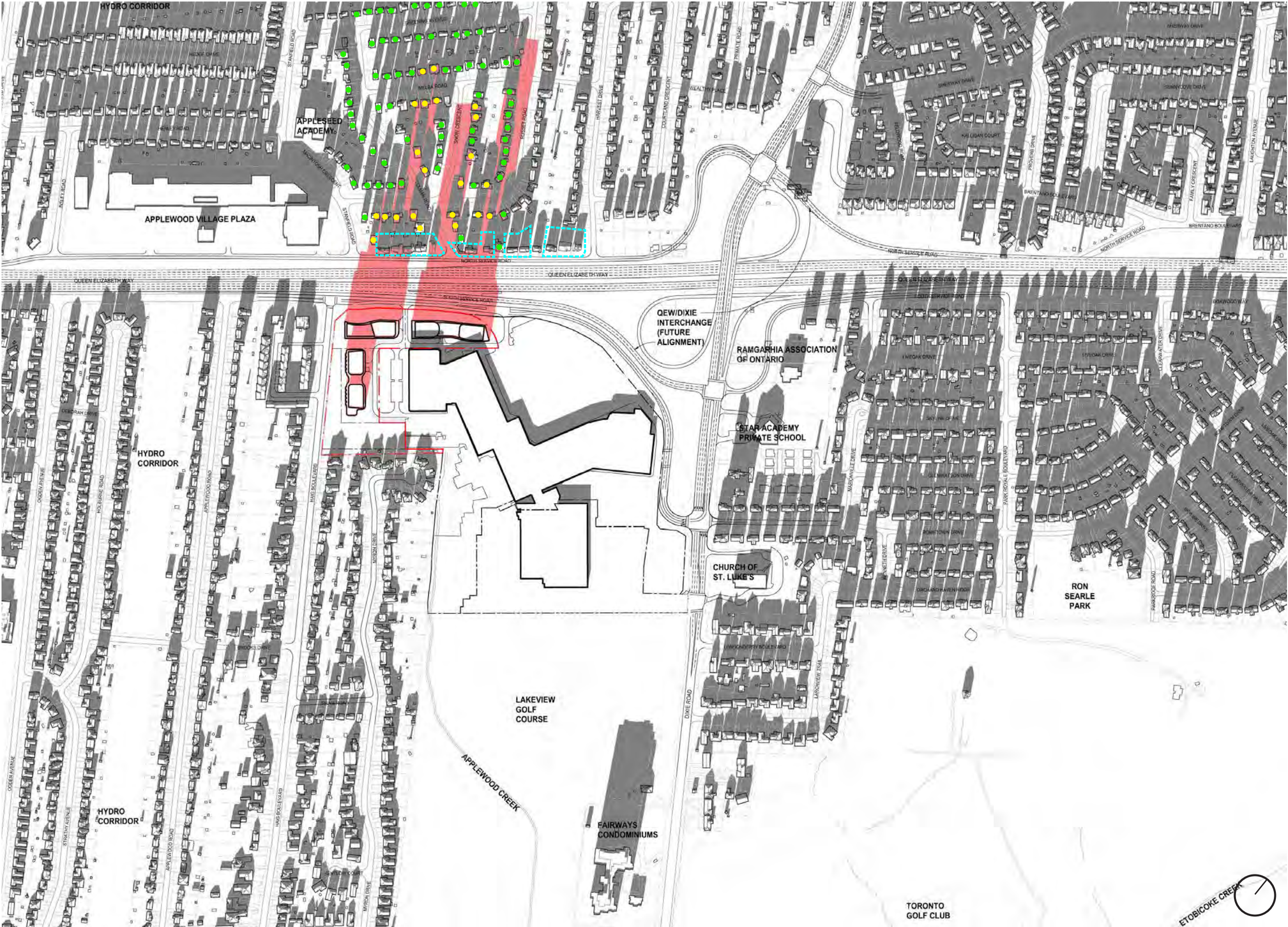
09:19



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

Dixie Mall Development



Dixie Mall Development

December 21

10:17

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

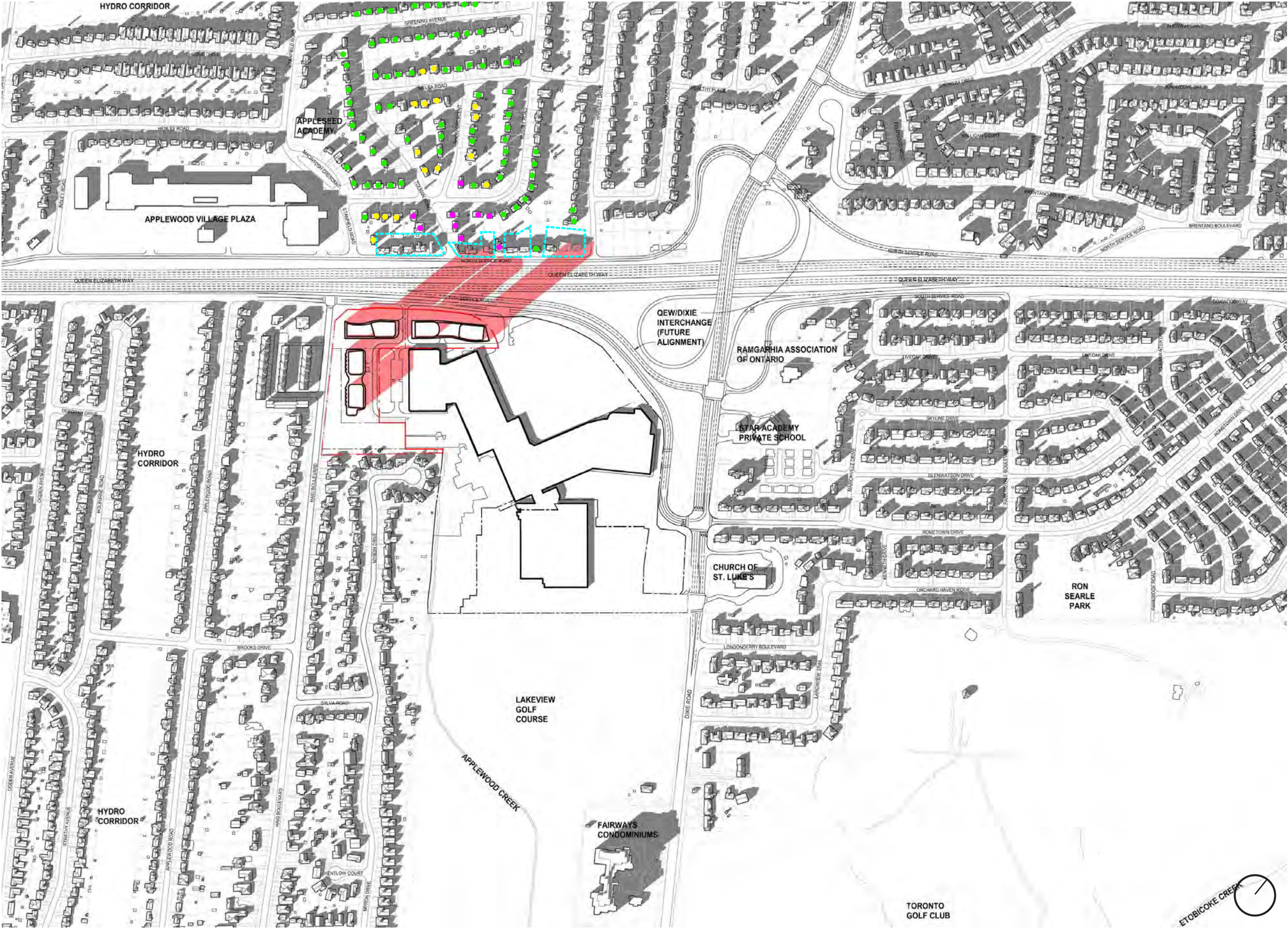


December 21

12:17

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary



December 21

13:17

Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

December 21

14:17



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

December 21

15:15



Legend

- Existing Shadows
- Proposed Shadows
- Shadow Impact / 1 test time
- Shadow Impact / 2 test times
- Shadow Impact / 3 test times
- Vacant Properties
- Site Boundary

**MARCH &
SEPTEMBER 21**

SUN ACCESS FACTOR

March 21/
September 21

8:35



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

9:12

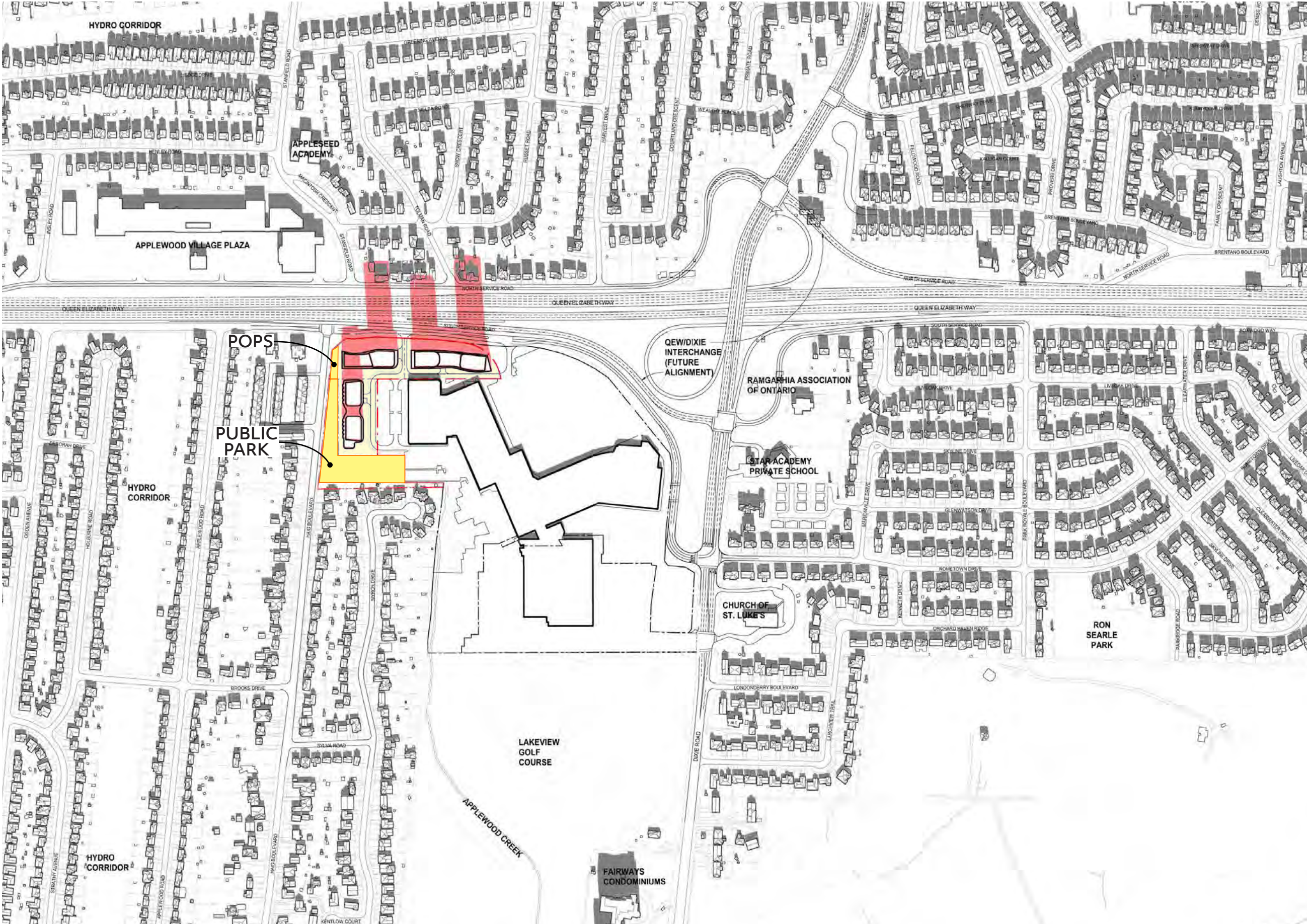


Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

10:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

11:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

12:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

13:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

14:12

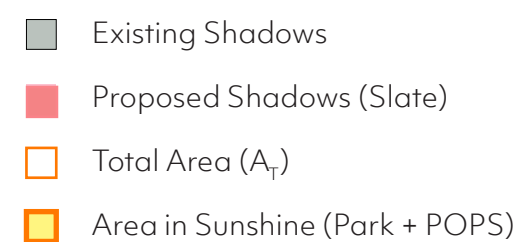


Dixie Mall Development

Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

15:12



March 21/
September 21

16:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

17:12



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)

March 21/
September 21

17:48



Legend

- Existing Shadows
- Proposed Shadows (Slate)
- Total Area (A_T)
- Area in Sunshine (Park + POPS)