AGENDA ADDENDUM

COUNCIL WORKSHOP

Tuesday, November 14, 2017
5:00 p.m.
Committee Room, Municipal Hall
355 West Queens Road,
North Vancouver, BC

Council Members:
Mayor Richard Walton
Councillor Roger Bassam
Councillor Mathew Bond
Councillor Jim Hanson
Councillor Robin Hicks
Councillor Doug MacKay-Dunn
Councillor Lisa Muri

NORTH VANCOUVER
DISTRICT

www.dnv.org

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District of North Vancouver
355 West Queens Road
North Vancouver, BC, Canada V7N 4N5
604-990-2311
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COUNCIL WORKSHOP

5:00 p.m.
Tuesday, November 14, 2017
Committee Room, Municipal Hall,
355 West Queens Road, North Vancouver

AGENDA ADDENDUM

THE FOLLOWING LATE ITEMS ARE ADDED TO THE PUBLISHED AGENDA

3. REPORTS FROM COUNCIL OR STAFF

3.1 Sportsfield Program – Inter River Park, Argyle School & Kirkstone Park

File No. 12.5810.01/000.000

Report attachments and PowerPoint presentation.

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NORTH VANCOUVER DISTRICT

DRAFT REPORT

District of North Vancouver

Inter River Park South Sports Field Feasibility Study and Conceptual Design Report

November 8, 2017

Prepared by:
Catherine Eiswerth
Manager, Landscape Architecture,
Sports & Recreation

R.F. BINNIE & ASSOCIATES LTD.

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OQM | Organizational Quality Management Program

BINNIE

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1 EXECUTIVE SUMMARY

This report summarizes the feasibility study, public consultation, and conceptual design options completed as part of the Inter River Park South Sports Field assignment. The study includes development of various options for construction of a new lit synthetic field facility including associated parking, access road, pathways, environmental remediation and related infrastructure work. Assessment of the geotechnical, environmental, park forest, transportation, existing park amenity and neighbourhood impacts of the proposed facility were also a key part of the assignment.

The study area is located in the southern portion of Inter River Park, with the potential location for one or more lit synthetic turf fields being the existing grass field and the forested areas to the immediate south and east. Traffic, environmental and tree assessment investigations extended beyond the immediate potential sports field areas, with the respective study boundaries based on overall impact to the surrounding area and proposed project.

As part of the initial public consultation process, three design options were explored including:

Option A - One single lit synthetic field with practice area within the existing grass field/ municipal solid waste landfill (MSWL) footprint. Key advantages and disadvantages include:

- Pros:
  - The warm-up area and spectator area are useful for the players and spectators.
  - The field is lit enabling evening use.
  - This option does not encroach on the riparian area or the existing forested area.
  - No relocation of the access road or existing utilities is required.
  - Tournament capability utilizing the upper area natural grass fields.
- Cons:
  - Lights and increased noise could be a concern for nearby residents.
  - Reduced opportunity for larger tournaments with a single synthetic field.
  - Preloading is required.

Option B - Two side by side lit synthetic fields. Key advantages and disadvantages include:

- Pros:
  - Substantial additional field inventory is provided with two synthetic fields.
  - The fields are lit enabling evening use.
  - Increased opportunity for larger tournaments with two synthetic fields.
- Cons:
  - Lights and increased noise could be a concern for nearby residents, particularly with removal of the forested area.

- Tree/habitat loss
- Riparian encroachment
- Ongoing differential settlement
- Longer preload duration
- Existing access road/utility relocation
- High relative cost.

Option C - Renovation of the existing grass field. Key advantages and disadvantages include:

- Pros:
  - No impact on tree/habitat loss
  - No riparian encroachment
  - Short preload duration
  - No existing utility relocation
  - Lowest cost of all the options
  - As this option adds no lighting or expansion of the existing field area, there would be minimal impact to nearby residents.
- Cons:
  - No lighting, which eliminates evening use.

After careful consideration of the technical implications, lifecycle costs, settlement induced maintenance risks, outcomes of the first public information session, stakeholder feedback and council workshop; and the resulting benefit with respect to increasing sports field inventory; staff were asked to investigate a two lit synthetic field option in further detail. Through this process, Option D was developed. Option D combines all the features of Option A (one lit synthetic field plus practice area) with the addition of a second lit synthetic field located in the forested area to the south-east.

Some of the key features, advantages and disadvantages of Option D include:

Pros:

- One lit synthetic field plus practice area ('Field 1', which encompasses Option A) is located within the existing grass field footprint, meaning no tree removal or access road relocation will be required for one of the fields.
- Substantial additional field inventory is provided with two synthetic fields. Both fields are lit enabling evening use. Increased opportunity for larger tournaments with two synthetic fields. The practice area further enhances tournament potential.
- Option D has several advantages over Option B (two side by side lit synthetic fields) including minimization of differential settlement, reduced construction cost, reduced impact to

underground services and no requirement to relocate the internal access road. Furthermore, the loss of forested area is about the same for both Option B and Option D.

- Construction could be staged allowing the preloading of Field 1 to proceed, followed by construction of Field 2 later (or vice versa). In addition, either field could be constructed independently of the other, or a second field could be deferred indefinitely if funding is unavailable or demand for a second field at Inter River Park is reduced. Note that a minimum timeline from start of preload construction (for Field 1) to field opening would be approximately 3 years. Conversely Field 2 located within the forested area, where soil conditions are stable, could be constructed within approximately 6 months.

Cons:

- There will be environmental, recreational, health and visual impacts arising from the project, with the removal of the woodland for Field 2, which is located within the forested area, resulting in the removal of 130 trees, and the requirement for 1025 replacement trees. However, there are sufficient environmental compensation opportunities within Inter River Park to offset these impacts.
- Lights and increased noise would be a concern for nearby residents. Preloading is required for Field 1.

An overview of the costs and construction timeframe for each option is indicated below:

Option	Cost	Construction Time Frame
A (One lit STF with Practice Area)	$6.2 M	Preload – 18 to 24 months Construction – 6 months
B (Two lit adjacent STFs)	$11.2M	Preload – 18 to 24 months Construction – 6 to 12 months
C (Natural Grass Field)	$1.9 M	4 months
D (Two separated, lit STFs with Practice Area)	$8.7 M	Preload – 18 to 24 months (Field 1 only) Construction – 6 months (per field)
Environmental/Habitat Compensation Work (req'd for Option B and D)	$1.3 M	12 months

A substantial portion of the cleared area of the site is comprised of a decommissioned municipal solid waste landfill (MSWL). Those areas not underlain by the MSWL are forested, with a network of trails used by the public. Geotechnical investigation and analysis has determined that the historic MSWL presents the greatest challenge and cost to the development of a synthetic field. Compression of the MSWL through the application of a minimum 4 m thickness of preload fill will be required to manage future differential settlement to a reasonable level. The preload placement and settlement period will be 18 - 24 months in duration, depending on the results of post-placement settlement monitoring. Once the preload settlement period has concluded, construction of a synthetic field within the preload area could begin.

The project scope includes closing the existing access to the park from Premier Street with a cul-de-sac. It was estimated that two synthetic fields will generate 58 new vehicle trips during the weekend peak hour. With two synthetic fields, the southern portion of the park was estimated to have a peak parking demand of 162 vehicles. Reconfiguration of the onsite access is proposed with one-way circulation to improve traffic flow through the parking areas and minimize vehicle conflicts. The park access road will accommodate pedestrians and cyclists through wider lanes (4.5 m versus 3.35 m), shared-lane markings, bike racks and pathways.

The primary environmental constraints with respect to the proposed field, parking and access road layout are the boundaries of the existing forest (south and east), Lynn Creek 30m setback (west) and wetlands (south). Implementing two of the proposed concepts, Options B and D, would require tree removal and result in a loss of passive recreation space to enable field development. Depending on which option is selected, up to 1.3 ha of the southern woodland would require removal. The decision with respect to develop or not develop the woodland is considered to rest with the District, in consideration of the net benefit of constructing an additional synthetic sports field at Inter River Park versus the loss of the woodland mitigated by habitat compensation.

An environmental review was completed by Envirowest Consultants Inc. They reported that the park is recovering from past land use (logging and municipal landfill) and has potential for improvement. It contains five habitat types - forested, scrub/shrub, immature riparian forest, grassed areas and unvegetated/developed. Birds, mammals, fish and amphibians/reptiles have been seen in the park. The presence of species at risk has not been confirmed on the property, however this does not mean they are not present. Drainage mitigation measures (infiltration swales, constructed wetland, pond) and habitat enhancement measures will have a positive impact. Habitat enhancements include removal of invasive plants, planting of native species, complexing of the existing wooded areas, creation of a bio-wetland, an expanded pond, adding fencing to exclude pedestrians and dogs from Lynn Creek's riparian zone, water quality and quantity improvements, light/noise mitigation, and construction period controls. Should development of Options B or D proceed, further assessment would be required prior to construction including detailed assessment of species-at-risk and mapping/quantification of invasive species presence. Long-term (minimum five years) monitoring is required to ensure the success of proposed mitigation/enhancement works.

A tree assessment was conducted by BC Plant Health Care Inc., reporting on the overall condition of the forest as well as making recommendations for individual trees. The total number of trees assessed was 361, in an approximately 4.5 ha block. Most of the species were big leaf maple, western red cedar and western hemlock. Of those, 130 are recommended for removal and 231 are recommended for retention. 27% of the trees were in poor, dying or dead states of health. Potential public hazards exist in the 10% of the bigleaf maples, which have contagious structurally depreciating pathogens and could fail without warning. 1025 replacement trees will be required should Options B or D be constructed. However, even with tree planting, as the replacement trees take years to mature, it will be decades before the lost habitat is recovered.

Community and stakeholder consultation was carried out during key stages of the project, and includes the following:

- Sportsfield User Group Meeting – October 2015
- NV Community Sport Council Presentation – November 2015
- Council Workshop #1 – January 2016
- Presentation #1: DNV Parks and Natural Environment Advisory Committee – January 2016
- Sportsfield User Group Meeting – July 2016
- Public Information Session #1 was held on August 31, 2016 to present and gather feedback on three preliminary options - one synthetic turf field and warm-up area (Option A), two side by side synthetic turf fields (Option B), and one natural grass field (Option C). Online consultation was provided from August 31-Sept 14, 2016 for those who were unable to attend the public information session.
- Presentation #2: DNV Parks and Natural Environment Advisory Committee – September 2016
- NV Community Sport Council Presentation – September 2016
- Council Workshop #2 was held on October 24, 2016 to present the findings of the feasibility study and public outreach concerning Options A, B and C to Council. Council directed staff to start planning to implement the single turf field option (Option A), and to continue to pursue other options for creating a second synthetic turf field adjacent to the proposed synthetic field at Inter River Park.
- Council Workshop #3 was held on February 6, 2017 to update Council on the District's long-term sports field program and funding strategy.
- Public Information Session #2 was held on June 21, 2017 to present Option D and gather feedback from residents. Online consultation was provided from June 21 to July 12, 2017 for those who were unable to attend the public information session.

Future Consultation to Include:

- Council Workshop #4 – Fall 2017 (to be confirmed)
- Presentation #3: DNV Parks and Natural Environment Advisory Committee – Fall 2017
- NV Community Sport Council Presentation – Fall 2017

The majority of the respondents for the public information session for Option D were from the broader community, whereas the first information session was mostly attended by adjacent park neighbours. For Option D, the main comments from nearby residents were concerns related to the environment, and loss of park space, forest removal, negative health implications of synthetic turf, increased traffic and noise. There was a preference for this project to be proposed in a different location. The broader community was generally in support of Option D as they consider it an opportunity to meet current and future field use demand, and host larger tournaments, which they feel is lacking on the North Shore.

2 INTRODUCTION

2.1 Background

Inter River Park has been developed as a regional, multi-venue athletic complex with multiple natural grass sports fields, a lacrosse box, a bike skills park, and numerous trails with access to the natural areas of the park as well as Lynn Creek. It is popular with local residents, dog-walkers, nature enthusiasts and also serves the regional population.

From 1956 to 1988 the park was operated as a municipal solid waste (MSW) landfill, including the portion of the study area comprising Field #1. Because of the underlying MSW, existing natural grass Field #1 has experienced substantial differential settlement causing the field surface and infrastructure (drainage, irrigation, backstop/dugouts, etc.) to become damaged. In its current condition, Field #1 is considered by the District to be unsafe and thus unsuitable for organized sports bookings. A complete renovation will be required to utilize the field to perform to the capacity of a typical grass field.

Conversion of Field #1 to a new synthetic turf field would expand the park's tournament center capability and would provide additional year-round sports field inventory, and provide some relief to other existing grass fields within the District. Inter River Park can support tournament activity, even just with one new STF. Construction of a second synthetic field at Inter River Park would substantially increase tournament potential and add to the District's sports field inventory.

While natural grass surfacing would be considered if synthetic turf was considered not feasible, a new sand-based natural grass field could not match the potential capacity (sports use hours) of a synthetic turf field. Synthetic turf is playable year-round and due to limitations on its' maximum hours of use without surface damage. There are typically no lights on natural grass fields meaning evening use in the peak soccer season would be further limited. One synthetic field provides 4 to 6 times the capacity of a grass field.

2.2 Intent

The intent of the feasibility review phase of the Inter River Park South Sports Field Feasibility Study and Conceptual Design Report is to undertake a feasibility study and prepare conceptual design options for the provision of increasing the sports field inventory at the park. Guiding principles include:

- Design to reflect development of Inter River Park as a regional, multi-use sports field tournament center.
- Accommodate a variety of field sports, including soccer, field hockey, football and baseball.
- Improve pedestrian access and connectivity.
- Improve service vehicle access, parking and circulation. Provide sufficient opportunities for drop-off.
- Improve safety and security.

- Minimize impacts to the environment and adjacent existing park uses.
- Protect and enhance the adjacent park wetlands, Lynn Creek riparian zone and the forested areas.
- Minimize impacts to neighbours (noise, traffic, etc.).
- Incorporate additional infrastructure associated with the proposed increased field inventory.
- Maximize benefits relative to costs.
- Minimize maintenance costs and field closures.
- Design to incorporate universal accessibility.
- Design to incorporate relocation of the Parks' nursery.
- Where effective, utilize latest technology in the design of the facility.

2.3 Project Location

Inter River Park is in the District of North Vancouver, within the Lynnmour/Inter River neighbourhood. The study area is at the south end of the site, and includes the existing natural grass baseball/soccer field (Field #1), as well as the surrounding park wetlands, forests, roads, parking and trails; Premier Street frontage, District nursery and the caretaker's residence.

Please refer to Figure 2-1 for a map showing the project location, study area and the potential sports field site within Inter River Park.

Figure 2-1 – Location of Inter River Park

2.4 Site History

Inter River Park has been developed over several years, with its original beginnings as a Municipal Solid Waste Landfill site. The landfill was decommissioned in 1988, and since then ongoing filling and remediation has taken place, with sports fields and other recreation amenities constructed.

Please refer to Figure 2-2 for the history of the park.

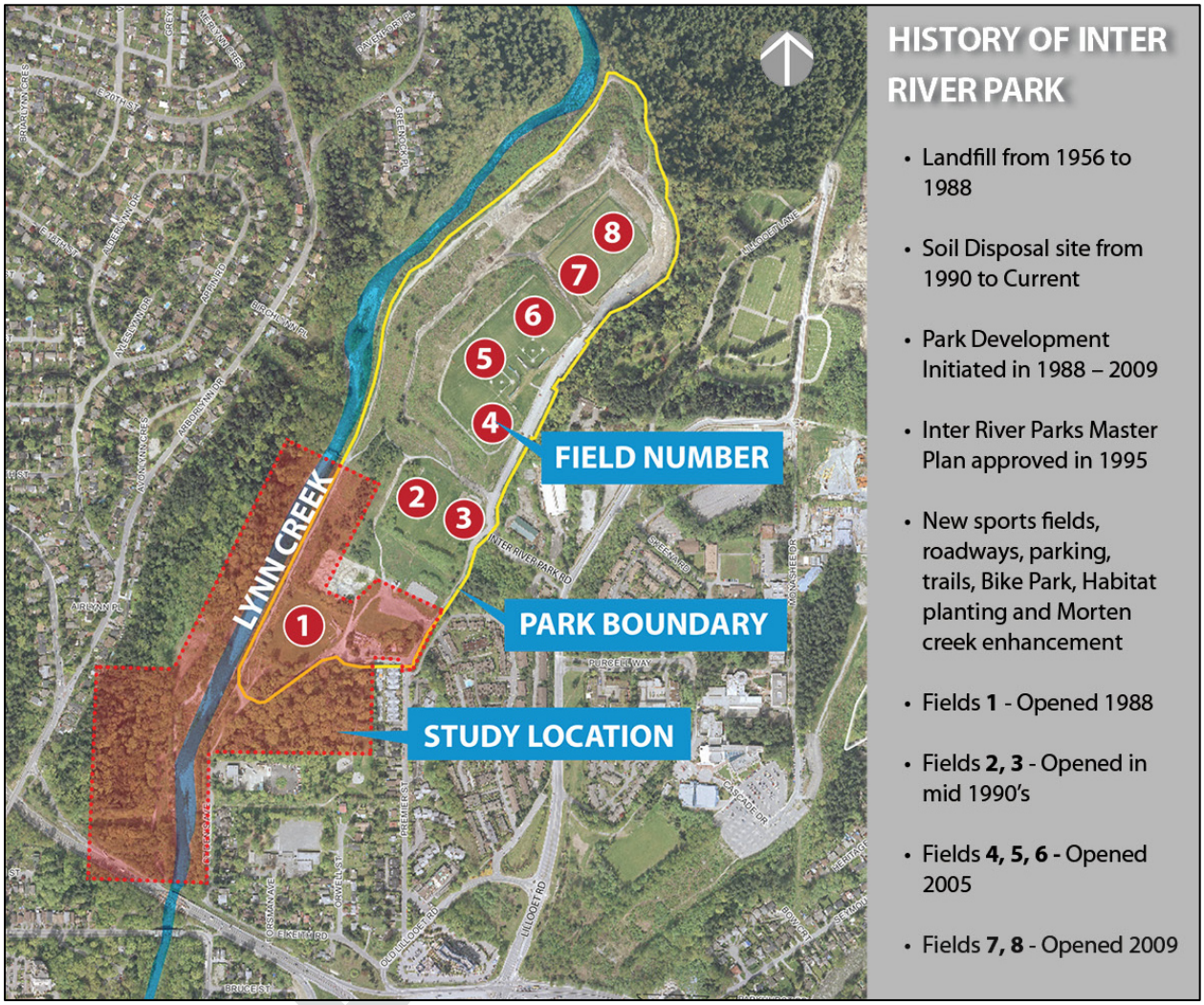


Figure 2-2 - History of Inter River Park

2.5 Study Objectives

The feasibility study component of the assignment seeks to:

- Identify field layout options, including the size and number of fields that would be feasible to construct on the site.
- Identify the parking and access requirements associated with each option.
- Prepare a conceptual design plan for each option, incorporating parking, access and the road closure of Premier Street to the south.
- Prepare a conceptual design for the relocation of the existing Parks' Nursery area to the former caretaker building site
- Determine whether synthetic turf is an appropriate surfacing material given the site geotechnical challenges.
- Identify the challenges and opportunities for each option.
- Develop a schedule for the design and construction of each option.
- Develop preliminary Class D cost estimates for each option.

2.6 Consultant Project Team Activities

The team contributing towards the feasibility study and conceptual design development includes the following consultant firms:

Firm:	**Role:**
R.F. Binnie & Associates Ltd.:	Prime Consultant/Team Project Manager Landscape Architecture/Sports Consultant Civil Engineering Traffic Engineering
Thurber Engineering Ltd.:	Geotechnical Engineering/Landfill Consultant
Envirowest Consultants Inc.:	Environmental Review (Fish and Wildlife)
BC Plant Health Care Inc.	Tree Assessment

The consultant team performed the following major activities as part of the feasibility study and conceptual design stage of the assignment:

- Previous reports, studies and investigative work completed by others were reviewed.
- A detailed site visit was completed with a photographic record of the existing conditions.
- Geotechnical investigation was performed and a report outlining recommendations for design and construction prepared.
- Environmental investigation was performed and a mitigation report prepared with recommendations.
- A traffic impact assessment was undertaken and a report prepared with recommendations.
- A tree inventory was undertaken and a report prepared with recommendations
- A base plan was completed incorporating District-supplied topographic survey and underground as-built service records.
- Meetings were held with District staff.
- Binnie prepared public engagement materials and attended 2 public information sessions located at Inter River Park.
- Conceptual designs were completed for the proposed park development options including the sports field(s), parking, access roads, pedestrian circulation, Premier Street closure and nursery area relocation.
- Class D cost estimates were prepared.
- The relative impacts and opportunities associated with each option were assessed.

3 EXISTING CONDITIONS

The existing surface conditions of the existing sports field and adjacent areas within the study are shown in the following photos and are as generally described below:

- Field #1 – a natural grass sports field in poor condition, with a backstop and dugouts located in the northwest corner of the field. (Photos 1 and 7)
- Gravel parking (poorly defined) adjacent to the lacrosse box. (Photo 2)
- A paved access road from Premier Street, with a gravel connection to the Lacrosse Box. (Photo 3)
- A Parks operation nursery area opposite Field #1. (Photo 4)
- Forested area with several walking trails on the east side of the gravel access road. (Photo 6)
- Gravel parking (poorly defined) along the edge of Field #1. (Photo 7)
- Lynn Creek 30 m setback riparian area on the west side of Field #1.

Photo 1 - Existing sports field

Photo 2 - Upper gravel lot

Photo 3 - Premier Street looking north

Photo 4 – Parks nursery

Photo 5 - Steep slope

Photo 6 - Forested area with trails

Photo 7 - Lower gravel parking area

4 ENVIRONMENTAL REVIEW

4.1 Environmental Review

This section summarizes many of the key features of the environmental report. Please refer to the environmental review review prepared by Envirowest Consultants Inc. which is included in the Appendix for complete details.

The primary environmental constraints with respect to the proposed field, parking and access road layout are the boundaries of the existing forest (south and east), Lynn Creek 30m setback (west) and wetlands (south).

Environmental site reviews were carried out by Envirowest Consultants Inc. on August 16, 2016, April 12, 2017 and May 9, 2017 to assess the current environmental conditions at the site. A large portion of the proposed two field footprint for Option D occurs within the existing grass field (Field 1 and warm-up area). Field #2 is located within the woodland at the south end of the park, which also includes multiple trails. The area to the west of the existing field occurs within an existing 30 metre riparian setback from Lynn Creek.

An environmental inventory prepared in 1998 identified a large and diverse number of species utilizing the park, and provides recommendations that remain valid. In particular, that report recommended that the southern woodland (where the Field 2 is proposed) not be developed. The 2017 environmental review work carried out as part of this study assessed the impact of developing the southern woodland and the recommended compensation measures. The decision with respect to develop or not develop the woodland is considered to rest with the District, in consideration of the net benefit of constructing an additional synthetic sports field at Inter River Park versus the loss of the woodland mitigated by habitat compensation.

A tree assessment was also carried out in conjunction with the environmental review. Please refer to the attached Arborist Report prepared by BC Plant Heath Care, which can be found in the Appendix.

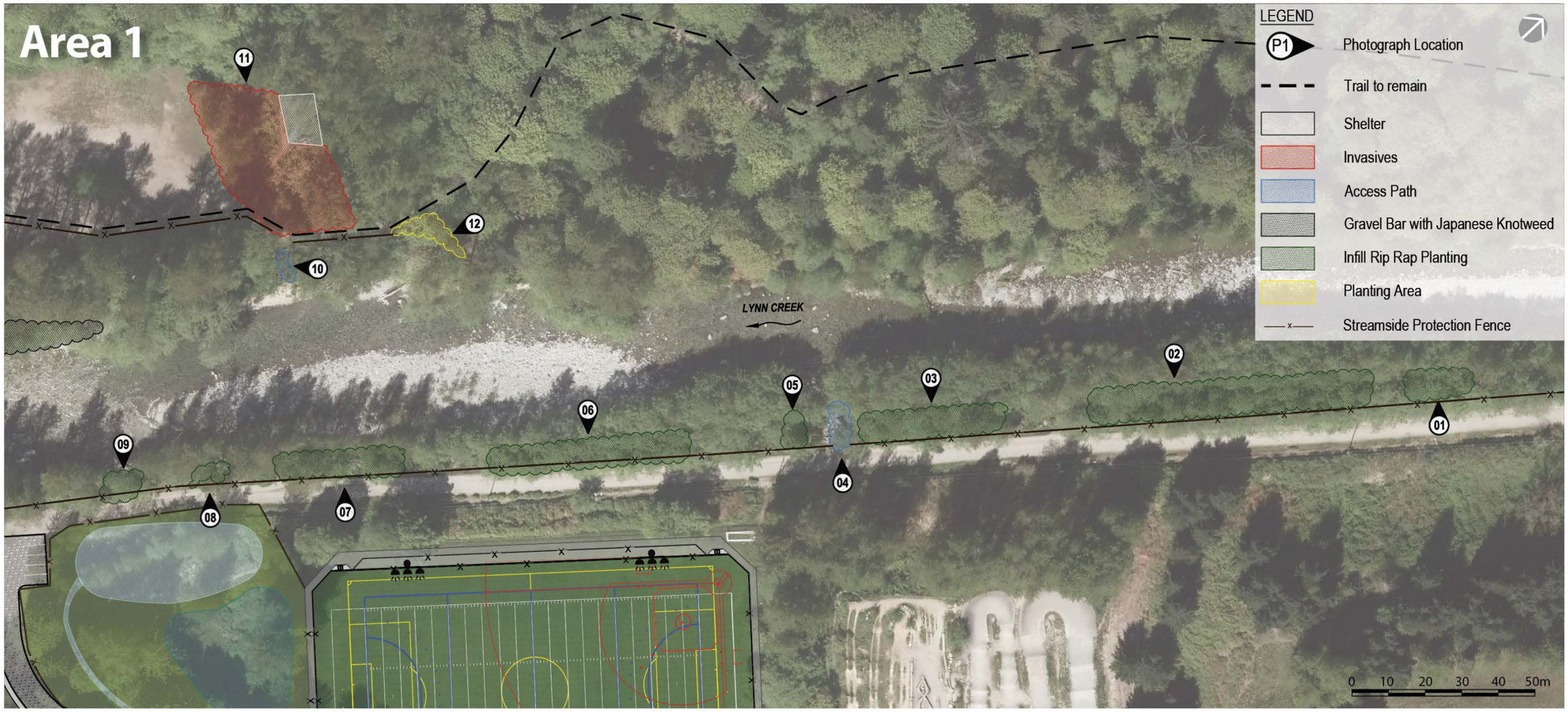
4.2 Environmental Improvements and Compensation Measures

As the current plan proposes to eliminate a portion (1.3 ha) of the southern woodland, reasonable compensation habitat must be provided as an offset for the loss. Proposed habitat enhancements include removal of invasive plants, planting of native species, complexing of the existing wooded areas, and creation of an expanded pond. Additional work includes several habitat restoration sites on the west side of Lynn Creek, and fencing to exclude pedestrians and dogs from much of the creek's riparian zone. Many impact mitigation strategies are proposed and include water quality and quantity protections, light/noise mitigation, and construction period controls.

Sufficient mitigation and enhancement opportunities are available to offset the proposed habitat losses. Long-term (minimum five years) monitoring is required to ensure the success of the proposed mitigation/enhancement works. Should development of Field 2 proceed, further assessment would be required prior to construction including detailed assessment of species-at-risk and mapping/quantification of invasive species presence. Proposed mitigation and enhancement works would also require detailing.

The following key plan shows two areas in Inter River Park where environmental improvements could occur, followed by detailed plans of these areas showing photos of the existing conditions and locations where infill planting is recommended.

Figure 4-1- Key Plan



Note: Photos 1-12 reflect current conditions and were taken on May 2, 2017


1-3, 5-6) Infill rip rap planting


4) Maintain beach access


7) Infill rip rap planting/remove invasive blackberry


8) Infill rip rap planting

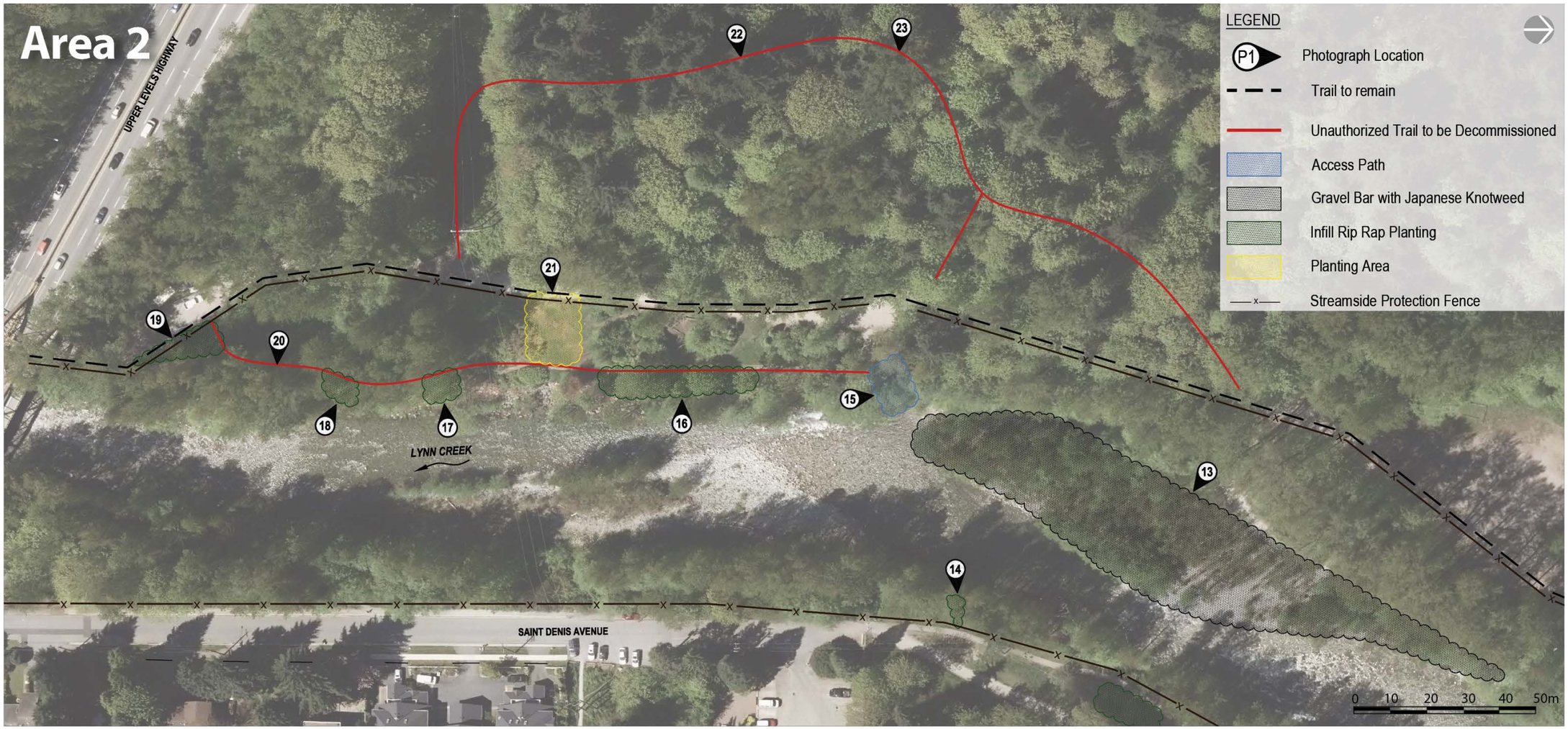

9) Re-vegetation/Infill rip rap planting


10) Maintain beach access


11) Remove shelter and invasive species and re-vegetation


12) Restoration planting

Figure 4-2 – Lynn Creek Environmental Improvements – Area 1



Note: Photos 13-23 reflect current conditions and were taken on May 2, 2017


13) Remove Japanese Knotweed throughout gravel bar


14, 16 - 18) Infill rip rap planting


15) Maintain beach access


19) Restoration planting


20) Decommission trail restoration planting


21) Restoration planting/ knotweed removal


22) Restoration planting


23) Remove makeshift bridge

Figure 4-3 – Lynn Creek Environmental Improvements – Area 2

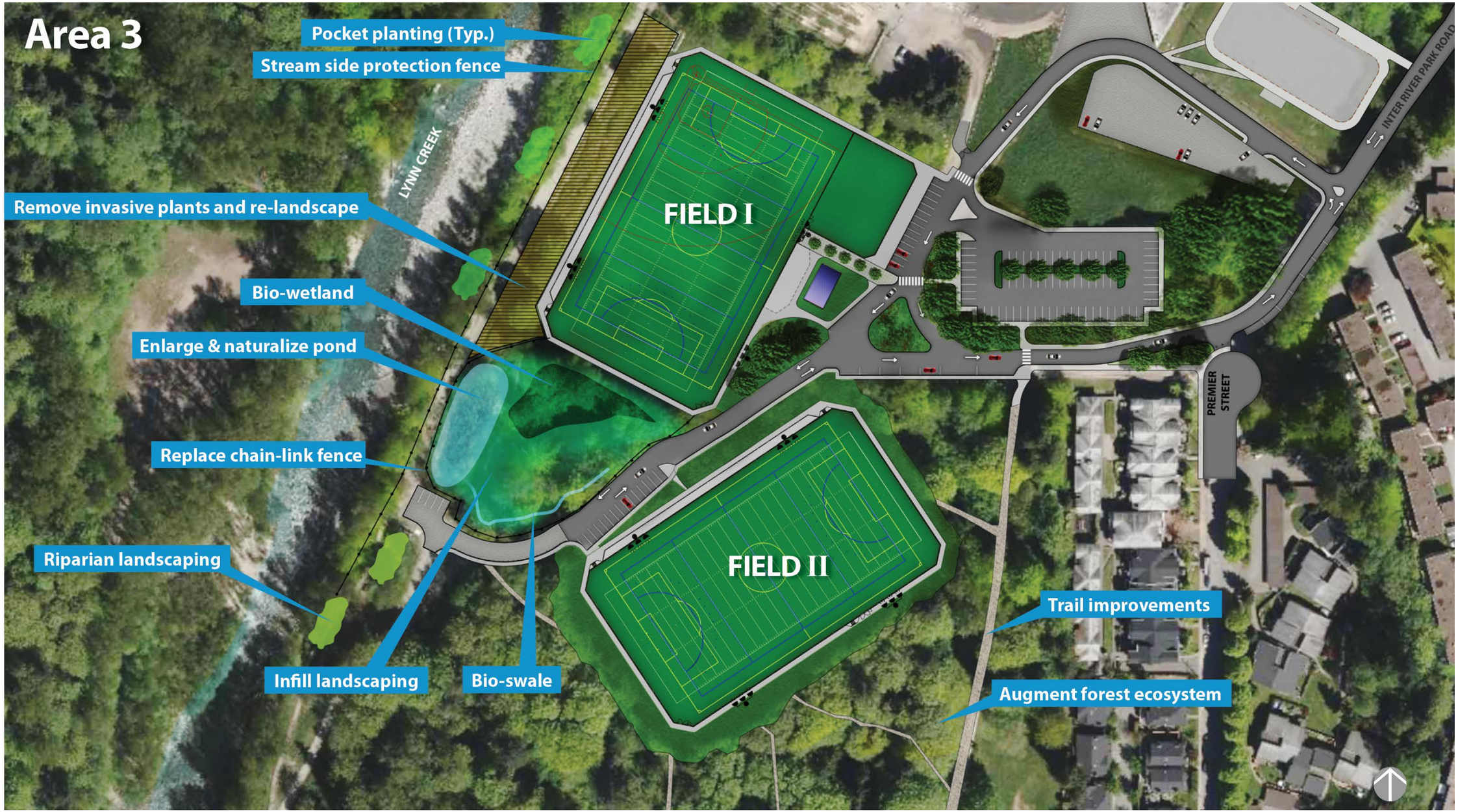


Figure 4-4 – Environmental Enhancements Adjacent to Field(s)

The bio-wetland shown in the previous plan would be similar to the precedent images shown below:

Figure 4-5 – Precedent Images - Bio Wetlands

In addition to the improvements to the existing riparian and forested area, the proposed road and parking area construction could be made more environmentally friendly than what is typical. Some examples of parking lots with shade trees and/or rain gardens are illustrated below. These concepts have been illustrated in the parking lot proposed in Concepts A, B and D.

Figure 4-6- Green Parking Examples

5 TREE ASSESSMENT

BC Plant Health Care Inc. prepared an arborist report which looks at the forest overall as well as at the individual tree level. It contains a map of the trees surveyed and lists the information in a table which includes the species, size, condition and recommendation, among other information. Of the 361 trees surveyed, 130 are recommended for removal, and 231 are recommended for retention. Should Option D go ahead, 1.5/4.5 ha of forested parkland will be impacted (33%) and 1025 replacement trees required.

The assessed area was disturbed by logging, probably in the early 1900's. The forest region is Coastal Western Hemlock but in the assessed area, there is a lack of viable regeneration. One reason is due to inappropriate light conditions in the understory. There is a lack of forest succession and it has not reached a climax state with the presence of pioneer and mid-successional species in the over-story. Succession should be encouraged by conducting reforestation that matches post disturbance regeneration.

The issues of removal and replacement are more complex than simply planting replacement trees. These issues include: Urban Heat Island Effect, decreased air quality, lost carbon sequestration and storage, effects on crime rate, reduced sense of community for residents, lost recreational opportunities, degeneration of the connection to the natural world, etc. It will take several decades to recover the social, economic and environmental value of the forest portions being removed should option D proceed.

Trees with Kretzschmaria along the proposed forest edge have been recommended for removal because of their high probability of failure. Kretzschmaria is a fungus affecting the lower roots of bigleaf maples and causes white rot. This can cause a tree failure with little or no warning, posing a potential public hazard.

When clearing the forest to build the proposed field, a new forest edge is created. It is possible that due to wind and exposure to the elements, the existing trees on the new exposed edge can fail. A pre-emptive measure could be to install larger replacement trees along the edge to help deflect wind and protect the existing trees. Planting larger trees along the edge would be an exception. The report recommends mainly planting younger trees (2 and 3 years old) because they are more responsive to transplanting and need less time to recover and establish.

The trees surveyed are indicated in the diagram on the following page.

Please refer to the Arborist Report prepared by BC Plant Health Care Inc. which is included in the Appendix for additional, detailed information.

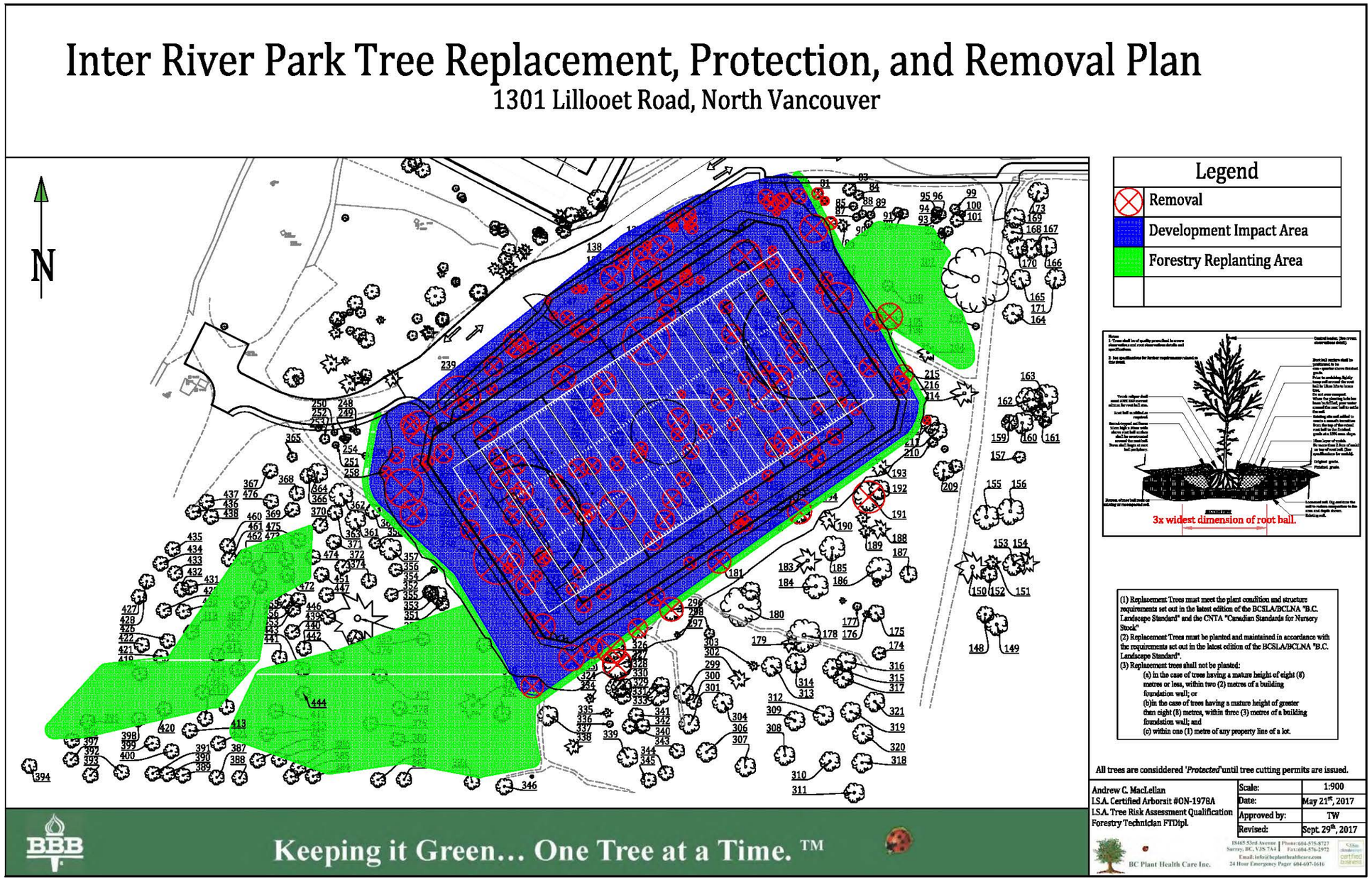


Figure 5-1 - Tree Survey

6 GEOTECHNICAL CONSIDERATIONS

The following drawing represents an overview of the significant geotechnical constraints impacting the design and layout of the project. In general, construction of a synthetic turf field within the footprint of the Municipal Solid Waste is considered feasible with preloading.

Test holes were drilled by a previous consultant, Sperling Hansen, in September 2015. Thurber Engineering Ltd. was hired to complete a more recent geotechnical investigation in 2016. The locations of all test holes (both those completed by Sperling Hansen and Thurber) are shown on the figure below.

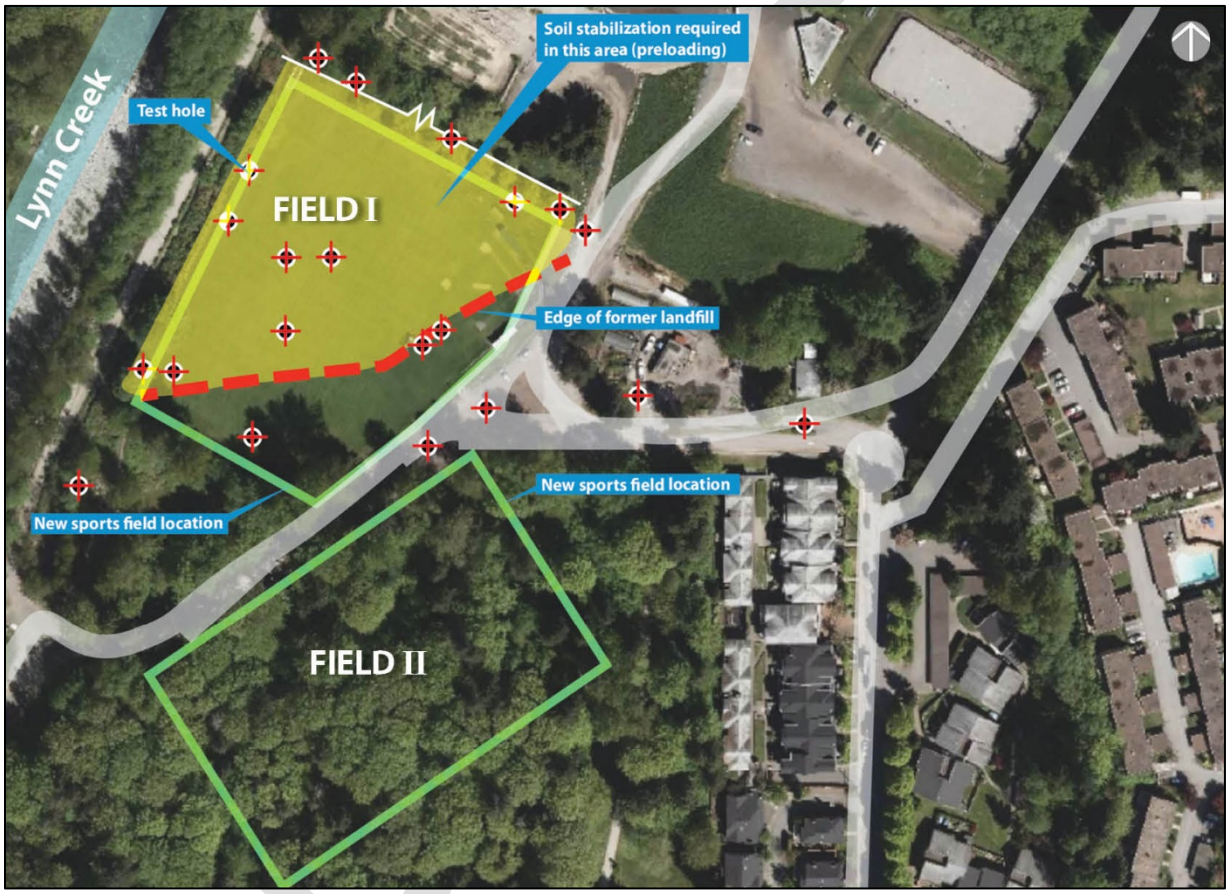


Figure 6-1 – Geotechnical Considerations

The thickness and composition of the materials encountered in each test hole varies. The top layer is grass field with up to 200mm topsoil. Underneath this layer is compact sand and silt with some gravel (all of this approximately 1.2-2.5m deep, except for one test hole at the very southwest corner of the field which has 5.5m of cover). In some locations, below this compact sand/silt layer is another 0.6m of sand, followed by municipal solid waste (MSW). The cap on the landfill consists of a mineral material which restricts the infiltration of water into the layers below. In locations with asphalt, the asphalt surface is between 50-75mm deep and sits on top of a granular base of 200-300mm thickness.

It is estimated that 50% of the compression has already occurred, due to the age of the landfill. Using an accepted conceptual model, the expected future settlement would be 250mm at the area where the depth of the MSW is 5m, and less settlement (25mm) where the thickness of the MSW is 0.5m. This is still difficult to predict, as the conditions between test holes can vary considerably. Any organic material would degrade as well. These figures are assuming no change in grade; if the grade is increased, additional settlement would be expected. The most critical area is along the edge of the MSW and this is where earthwork and site preparation would be required to help stabilize it.

A synthetic turf field is sensitive to settlement (both total and differential). To reduce these risks, all of the MSW would have to be removed below the field footprint and replaced with granular engineering fill. However, this method would be very expensive.

If the MSW is left in place, settlement should be expected (even with preloading). Settlement results in additional maintenance for the field, re-leveling or reconstruction. These are risks that should be known before proceeding.

Options A and B - Requires preloading and a lengthy process. Grass and organics would need to be removed up to 5m beyond the perimeter. Compacted granular fill would be added. Settlement plates would be placed on this layer at an equal distance of 15m and measured periodically for settlement. Inclinometers and piezometers would be installed to measure conditions over time. More fill of the same type in equal thickness would be added up to 3m above the STF design elevation. After this stage, the preload would be removed, and the subgrade prepared. Further geotechnical assessment would be needed to analyze the preload monitoring data that was collected in order to project the future settlement and make recommendations for the STF field.

Option C– No preloading is required for this option, but settlement should be expected. Field maintenance would be required periodically and involve placing additional sand fill in areas that have settled, possibly every 6-24 months.

Option D - Field #2 is outside of the former landfill boundary and will not require any preloading. See Option A (above) regarding Field #1.

Please refer to Appendix C for the complete geotechnical report prepared by Thurber Engineering Ltd.

7 TRAFFIC AND PARKING ASSESSMENT

This section provides an overview of the detailed traffic impact assessment report including recommendations for parking and access road improvements.

7.1 Traffic and Parking Assessment Overview

The traffic impact assessment examined the impact of the development of one synthetic field as well as two synthetic fields. For the purposes of this overview, we are summarizing the traffic impact requirements for a two-field development with a warm-up area. Should a single synthetic field be developed, the parking and circulation requirements would remain the same, however, a reduced number of additional parking stalls would be required (refer to detailed report in the Appendix for complete information).

It was estimated that the project will generate 58 new vehicle trips during the weekend peak hour, with 28 vehicles entering and 30 vehicles exiting. After development of two fields the park was estimated to have a peak parking demand of 162 vehicles. It is noted that if only one field is constructed, the estimated parking demand would be reduced to 112 vehicles.

As part of the project, it is proposed to construct new parking areas with one-way circulation through the areas adjacent to the north field. This will provide an efficient flow of traffic through the parking areas and minimize vehicle conflicts. Where possible, marked parallel parking spaces should be provided along the internal roadways in the south park area. Parking stall bumpers should be installed in the existing gravel parking lot near the existing lacrosse box to increase the capacity of the parking areas.

The site will include one bus pullout located on site. There will also be space for two buses to park during the day within the parking area. Additional demand for bus parking is expected to be accommodated in the north park area parking facilities.

Based on the traffic analysis conducted, the two study intersections are expected to operate at acceptable levels during the weekend peak periods with the proposed relocation of the access to the south park area of Inter River Park.

To accommodate pedestrians and cyclists, the access road to the park shall provide a 4.5 m travel lane in both directions to support cyclist and vehicular traffic. Additionally, sidewalks should be constructed on both sides to tie-in to the existing sidewalks on Inter River Park Road. It is noted that this measure may come later as the park is developed further. A connection is to be installed for pedestrians and cyclists from the north end of Premier Street to the park.

"Share the road" warning signs and "sharrow" paint markings (i.e. shared-lane markings) should be installed on the travel lanes throughout the park to warn drivers of cyclists on the roadways. A 30km/h speed limit is recommended throughout the park to improve the safety for pedestrians and cyclists. The roadways should also include wide speed humps to reduce the vehicle travel speed. Safe, well lit, and dry bicycle parking shall be provided on site immediately adjacent to the proposed fields, as per the District's Bylaw standard. The south park area should include enough bicycle parking for 78 bicycles.

Please refer to the Inter River Park STF Design Traffic Study prepared by Binnie & Associates Traffic Division which is included in the Appendix for additional, detailed information.

8 DESIGN DEVELOPMENT

8.1 Overview

The following options (A, B and C) were explored and presented at the first public information session on August 31, 2016. Subsequent to the Council workshop held on October 24, 2016, Council directed staff to proceed with the detailed planning and development of Option A while pursuing other options for creating a second synthetic turf field adjacent to the proposed synthetic field.

Option D represents Option A (single field plus warm-up area) with an additional field located directly across the existing access road.

Option D was presented at the Public Information Session on June 21st.

We are outlining below the key features of each option, with further elaboration on Options A and D.

8.2 Why Two Fields?

The Sports Field Needs Assessment (Rev. 2017), identified a need for a tournament facility at Inter River Park which includes a two-field synthetic turf field facility.

The Seylynn and Bridgman Park Masterplan completed in 2015 identified the need to replace the sports field being displaced at Seylynn with a new field at Inter River Park

Given the high rainfall on the North Shore, combined with the fact that one synthetic turf field can provide roughly four times the usage of one traditional grass field, and that games and practices can take place during inclement weather, means that having two fields would meet the need in our climate. In addition, due to the relatively steep topography common on the North Shore, there are few available sites where two new synthetic turf fields can be constructed adjacent to each other.

While a single synthetic field option would allow for tournaments when considered in conjunction with the existing upper natural grass fields, a two-field configuration at Inter River Park would allow for tournaments (including higher level tournaments) to be held that may not currently be accommodated in North Vancouver District.

8.3 Option A – One Synthetic Field Plus Warm-up Area

Option A proposes a single multi-use synthetic turf field with an adjoining practice/warm-up area. The main field is sized to accommodate a 110m x 64m soccer pitch or a full-size American rules football fields as well as providing the option for several other field sports. The warm-up area provides space for users to warm-up before their scheduled time on the main field. This helps speed up the change over time between user groups. The additional space also provides an opportunity to book two separate user groups concurrently such as an adult soccer club on the main field and a youth club, super 8 game on the practice field. The overall footprint of the new field is smaller than the current natural grass area allowing for a large spectator area which could accommodate a grandstand. The remaining open spaces east of the new field provides a passive use area for park visitors or a staging area for use during larger tournament events.

Pedestrian circulation improvements include a walkway around the perimeter of the new field, paved access routes from parking areas including marked crosswalks, and a small plaza area, complete with shade trees, which helps identify the main entrance to the new facility. Additionally, a new paved walkway connecting the new facility with the existing washroom building and upper parking lot is proposed. Pedestrian access from adjacent neighborhoods to existing trails is also improved by a proposed sidewalk linking Inter River Road to Lynn Creek. Vehicular circulation is improved by creating a fully paved, one-way loop within the park which minimizes pedestrian-vehicle conflicts. The new configuration creates a single point of entry from Inter River Park Road in anticipation of the future closure of Premier Street.

Additional parking is proposed for the area where the existing Parks nursery is located. This new lot provides parking that is separate from the main circulation route there-by reducing congestion during peak hours. The lot provides safe and convenient access to the new field via a marked crosswalk and also includes a perimeter walkway linking to pedestrian connections to other parts of the park.

This option does not encroach on the naturalized areas surrounding the existing grass field including the Lynn Creek riparian setback. Improvements to the parking areas south of the new field are contained within existing limits of disturbance and propose additional measures to protect sensitive habitat areas. Proposed rain water management facilities are integrated with the existing sediment pond south of the field and include enhancements to naturalize the space to create additional habitat as well as a visual amenity.

Please refer to the following conceptual design plan for Option A.

Figure 8-1 - Option A - One Synthetic Field Plus Warm-up Area

Option A

8.4 Option B – Two Side by Side Synthetic Fields

Option B proposes two side by side synthetic turf fields, without a warm-up area. The additional park amenities, including parking and access roads are similar or the same as Option A.

Advantages of Option B include additional field inventory and lighting for more night use. As in Option A, lights could be a problem for nearby residents. Tree/habitat loss, riparian encroachment, settlement potential, long preload duration, existing utility relocation and extraordinary cost are also disadvantages. Furthermore, parking demand may not be met with the proposed layout.

A discussion of the advantages and disadvantages of Option B versus Options A and D are described in detail in the next section.

Please refer to the following conceptual design plan for Option B.

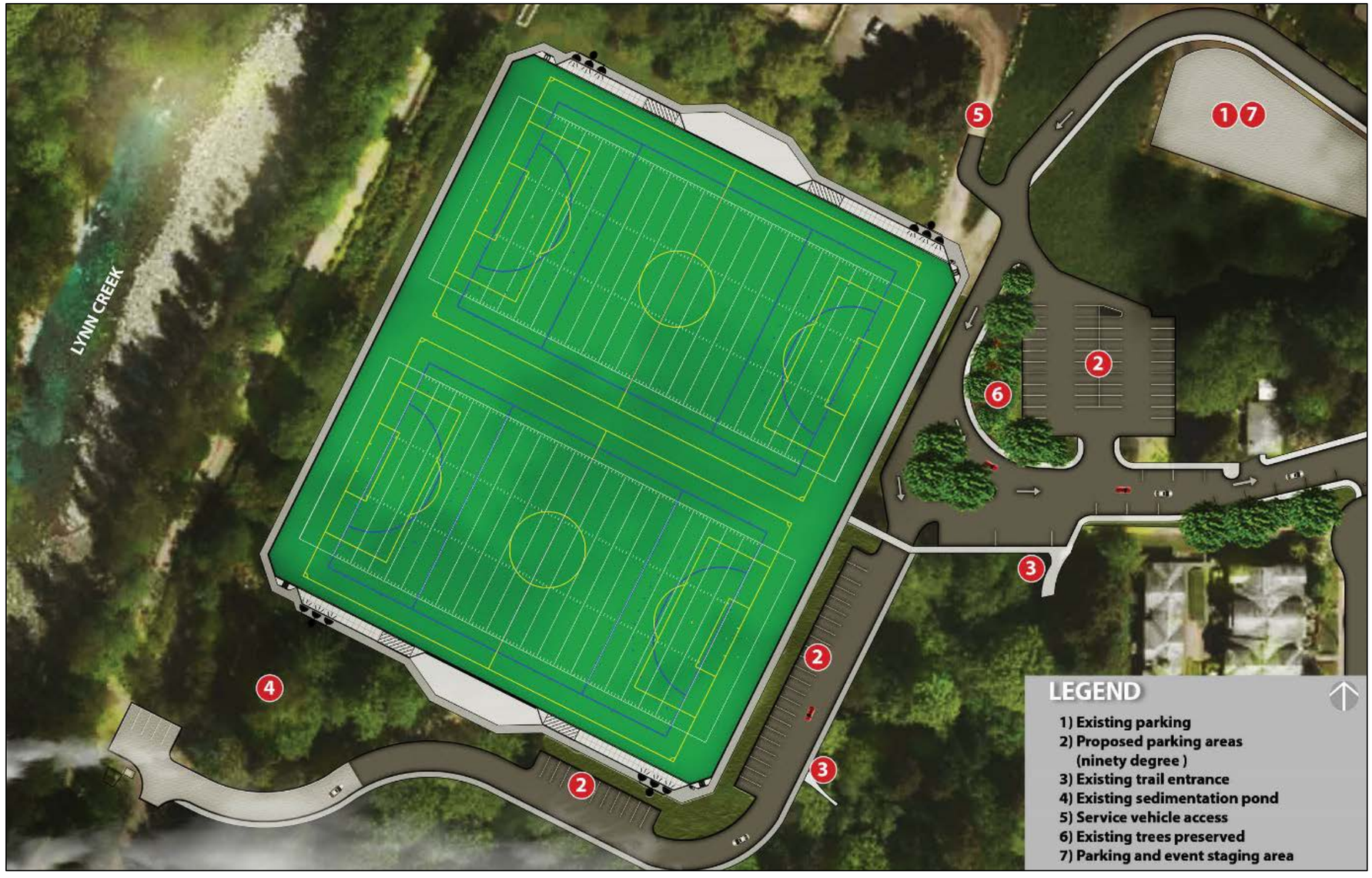


Figure 8-2 – Option B – Two Side by Side Synthetic Fields

Option B

This option proposes a synthetic turf 'Super Field' which would accommodate two multi-use sports field pitches. Each pitch is sized to accommodate a 110m x 64m soccer pitch or two full-size American rules football fields as well as providing the option for several other field sports

The 'Super Field' format also allows for added programming flexibility as games, or training exercises can be run across both fields if need be. Spectator and players areas are located at the north and south ends of the 'Super field', along the sidelines, in order to create a contiguous surface with no obstruction separating the two pitches. As in Option A, several traffic circulation and parking improvements are proposed in order to accommodate the higher intensity of use expected for the new field facility. Pedestrian circulation improvements are also improved as in Option A with exception of the field entrance plaza as there is insufficient space.

8.5 Option C – Natural Grass Field

Option C proposes complete renovation of the existing natural grass field with construction of a sand based, irrigated natural grass field at the same location as existing. There is a greatly reduced scope of additional park amenities, and no increase in parking. The natural grass option includes some modifications to the general layout, with the chain-link backstop relocated to the North-West corner of the field, allowing for a larger baseball field. Relocating the backstop from the east side of the field also opens the space to the rest of the park and makes it more inviting for passive use. Parking and access to field are unchanged from the current condition.

Advantages to Option C include no impact on tree/habitat loss, no riparian encroachment, short preload duration, no existing utility relocation and lowest cost of all the options. Disadvantages include no lighting so it cannot be used at night. This could be an advantage for the neighbouring residents, since there would be less noise and light pollution. An additional disadvantage is no increase in additional field inventory for the district.

A discussion of the advantages and disadvantages of Option C versus Options A and B are described in more detail in the next section.

Please refer to the following conceptual design plan for Option C.

Figure 8-3 – Option C - Natural Grass Field

Option C

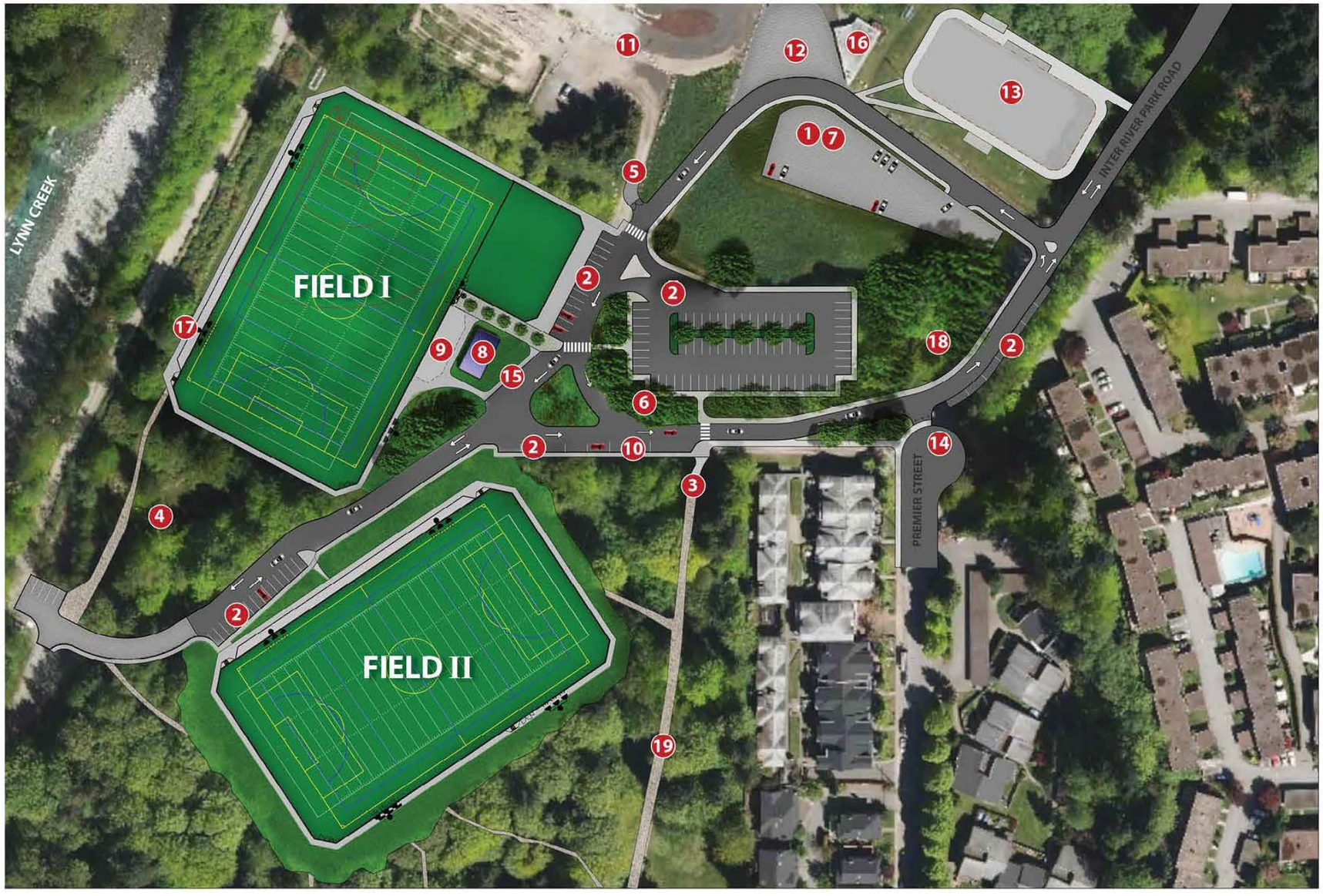
8.6 Option D – Two Separated Synthetic Fields Plus Warm-up Area

Option D proposes two synthetic turf fields plus a warm-up area. The layout of the one synthetic field plus warm-up area is exactly as described for Option A. All park amenities are also the same as included with Option A. The primary difference between Option A and D is the inclusion of a second synthetic field and some additional parking to support two fields (versus one).

Advantages of option D include no riparian encroachment, no existing utility relocation, parking demand is met and additional field inventory. Disadvantages of this option include higher cost and tree/habitat loss.

A discussion of the advantages and disadvantages of Option D versus Options A and C are described in detail in the next section.

Please refer to the following conceptual design plan for Option D.



LEGEND

1) Existing parking
2) Proposed parking areas (162 total - 150 ninety degree / 12 parallel)
3) Existing trail entrance
4) Existing sedimentation pond
5) Service vehicle access
6) Existing trees preserved
7) Parking and event staging area
8) Future potential field house and washroom location
9) Spectator area
10) Bus parking stalls (2)
11) Existing bike skills facility
12) Bike skills park drop-off area
13) Future sport court (by others)
14) Emergency access
15) Proposed drop-off area
16) Existing field building/ washrooms
17) Proposed field lights
18) Future park operations area
19) Existing trail

Figure 8-4 - Option D – Two Separated Synthetic Fields Plus Warm-up Area

Option D

Visualizations of Option A and D are shown in the graphics below:

Figure 8-5 – Rendering of Option A

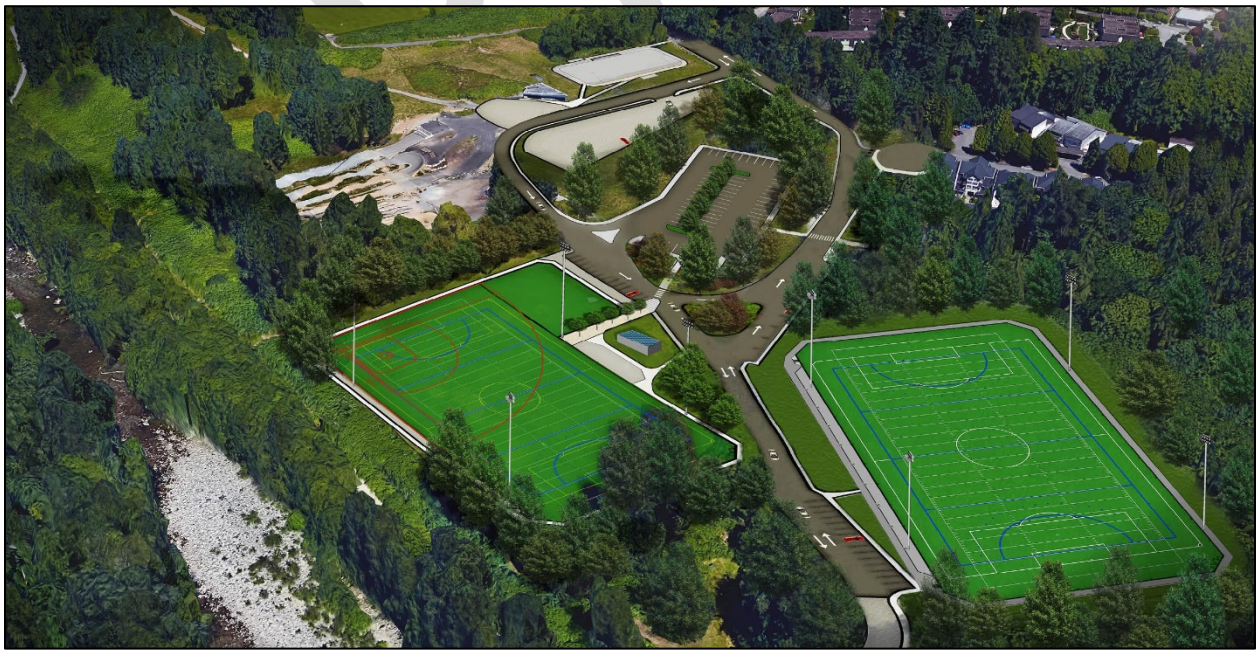


Figure 8-6 - Rendering of Option D

8.7 Comparison of Options

After careful consideration of the technical implications, lifecycle costs, settlement induced maintenance risks, outcomes of the public consultation process, stakeholder feedback and council workshop, and the resulting benefit with respect to increasing sports field inventory, staff were asked to investigate Option D'.

Some of the key features of Option D include:

- One synthetic field plus warm-up area ('Field 1', which encompasses Option A) is located within the existing grass field footprint, meaning no tree removal or access road relocation will be required. Field 1 is located over the MSWL and will require preloading.
- One synthetic field ('Field 2') located directly across the existing access road from Field 1. Field 2 is located within the forested area and will result in the removal of 130 trees, and the requirement for 1025 replacement trees.
- There will be environmental impacts arising from the project, in particular with the removal of the forested area for Field 2. There are sufficient environmental compensation opportunities within Inter River Park to offset these impacts.
- A minimum timeline from start of preload construction (for Field 1) to field opening would be approximately 3 years. Conversely Field 2 located within the forested area, where soil conditions are stable, could be constructed within approximately 6 months.
- Construction could be staged allowing the preloading of Field 1 to proceed, followed by construction of Field 2 later (or vice versa). In addition, either field could be constructed independently of the other, or a second field could be deferred indefinitely if funding is unavailable or demand for a second field at Inter River Park is reduced.
- Increased parking demand can be met with the creation of new parking areas on site with peak overflow on-street parking along Premier Street
- Option D has several advantages over Option B (two side by side fields) including:
    - A portion of the impacted existing treed area on the south-west side of the field in Option B is considered part of the Lynn Creek 30 m setback riparian area, and would require the permanent removal of vegetation and trees.
    - Large grade differences as well as varying soil conditions within the two-field footprint of Option B result in a high risk of future differential settlement, which would lead to high maintenance cost and field closure for repair purposes. To minimize future field repair risk, closures and cost, a longer preload settlement period would be required.
    - Several utilities including the leachate collection system, a large diameter storm sewer, and water main are located within the footprint of the synthetic turf (in Option B) and would therefore require removal and relocation, adding about 12 months to the project timeline and significant added cost (about $1.6M).
    - Furthermore, the loss of forested area is about the same for both Option B and Option D.

Option A (which is a component of Option D) may be considered if the District considers the resulting woodland removal and environmental impact does not justify the benefit of a second synthetic turf field at Inter River Park.

Options C is no longer being pursued as a natural grass field does not satisfy the District's need for an additional synthetic field.

The following tables illustrate and compare the major criteria for each design option and how they fare in terms of impact.

Option A – One Synthetic Field Plus Warm-up Area			
Criteria	**No Impact (or Benefit)**	**Some Impact**	**High Impact**
Tree/Habitat Loss			
Riparian Encroachment			
Settlement Potential			
Preload Duration			
Ex. Utility Relocation			
Extraordinary Cost			
Future Maintenance Risk			
Parking Demand Met			
Additional Field Inventory			

Option B– Two Side by Side Synthetic Fields			
Criteria	**No Impact (or Benefit)**	**Some Impact**	**High Impact**
Tree/Habitat Loss			
Riparian Encroachment			
Settlement Potential			
Preload Duration			
Ex. Utility Relocation			
Extraordinary Cost			
Future Maintenance Risk			
Parking Demand Met			
Additional Field Inventory			

Option C – Natural Grass Field			
Criteria	**No Impact (or Benefit)**	**Some Impact**	**High Impact**
Tree/Habitat Loss			
Riparian Encroachment			
Settlement Potential			
Preload Duration			
Ex. Utility Relocation			
Extraordinary Cost			
Future Maintenance Risk			
Parking Demand Met			
Additional Field Inventory			

Option D– Two Separated Synthetic Fields plus Warm-Up Area			
Criteria	**No Impact (or Benefit)**	**Some Impact**	**High Impact**
Tree/Habitat Loss			
Riparian Encroachment			
Settlement Potential			
Preload Duration			
Ex. Utility Relocation			
Extraordinary Cost			
Future Maintenance Risk			
Parking Demand Met			
Additional Field Inventory			

8.8 Public Consultation

Several opportunities for public input have occurred, to gain a better understanding of community and stakeholder needs, including public information sessions on August 31, 2016 and June 21, 2017. Feedback was collected by survey in both hardcopy format and on the DNV website for both sessions. In addition, during key stages throughout the project there have been council workshops, sportsfield user group meetings, sport council presentations and DNV Parks and Natural Environment Advisory Committee Presentations.

8.8.1 Public Information Session #1

For the first public information session, there were 176 responses to the survey. The vast majority of respondents lived in the immediate neighbourhood, many of them long-term residents who have lived there for over 6 years (25% lived there for 6-10 years and 46% for more than 10 years). The majority were middle aged with 31-45 years old being the highest number (42% of respondents) followed by 46-60 (39%). The top reasons for visiting the park included walking/trail user, nearby resident and dog walking. The main methods of transportation used to get there were walking (123 responses), followed by car (77) and bike (75). When asked about their comments regarding circulation (access roads, parking and closure of Premier Street), more people wrote that they support closing Premier Street (35) than those who did not (9). Some residents were concerned with the impact the anticipated traffic would have on the neighbourhood (10). When asked about the grass sports field design, more people wrote that they preferred grass (25) than those who wrote that they preferred synthetic turf (12). When asked about the synthetic field design, more people wrote that they preferred grass over synthetic turf (18 vs 13). When asked if they had any final comments to add, the most common themes were dog walkers hoping that this project wouldn't affect them negatively. There were also concerns about forest removal, and an increase in traffic.

8.8.2 Public Information Session #2

For the second public information session, there were many more surveys completed (1288 usable responses); the majority of which were submitted online rather than hardcopy. The feedback period was three weeks long. The data was analyzed from two perspectives to identify trends – the first was dividing it into nearby residents as compared to the broader community, and the second was looking at the data overall.

Nearby Residents/Broader Community

Whereas the first public information session was mainly attended by local residents, the respondents for the second public information session came from a wider geographic area. Only 259 responses were from nearby residents (living within 17 immediate postal codes adjacent to the park), and the remainder (1029) were from the broader community. When looking at the data in terms of nearby residents compared to the broader community, their needs are quite different. The majority of nearby residents preferred one field, and used the park for walking and dog walking. They travelled by foot or bike. The members of the broader community preferred two fields, and travelled to the park by car to use the sport fields.

Overall Results

When looking at the data overall, more people preferred two fields vs one field. The majority of visitors came to the park to use the sports fields, so it makes sense that they would prefer more field inventory. The second most popular activity was walking on the trails. Most people travelled to the park by car (which has an impact on the parking requirements).

Some parts of the survey allowed for general comments to be written. Key themes from these comments include the following:

- Concerns about loss of park space and forest removal:
  - Well used by the community, local school and families (all ages, abilities and incomes) throughout the seasons for informal, natural, imaginative and physical, play; walking, running, biking; environmental education, nature appreciation, relaxation
  - Rare floodplain forest (trees, shrubs and wildflowers) provides shade, improves air quality, reduces carbon footprint; provides habitat for animals, amphibians, birds
  - Provides visual and sound buffer between Digger Park / adjacent residents and sporting events in Inter River Park, highway and new towers. So much forest has already been lost for fire training centre, highway and road expansion, new developments, etc.

- Concerns about ATF field:
  - Environmental and health impacts; additional vehicular traffic; increased noise and light pollution; loss of 'natural' grass field for informal use; build ATF field in a location that's already disturbed (e.g. school sites for maximum use); spread ATF fields out throughout District

- ATF fields and fieldhouse:
  - Need for additional ATF fields to meet current and future demand for practices and games in rainy and snowy weather, and at convenient times; to keep kids interested, attract more players, and stay competitive
  - Health and social benefits of active living, team sports and life skill development for all ages at a reasonable price
  - Ability to host tournaments and events with economic benefit to District. Good location with an existing tournament facility, centrally located in North Vancouver, and easy access Highway 1
  - Clubhouse provides a home for NVFC; possibility to purchase and consume food and drinks; and stay dry watching games and practices
  - Accommodate other sports (e.g. baseball, field hockey, football); health concerns of crumb rubber;

8.8.3 Conclusion

To summarize, it appears that the nearby residents prefer the least change. They walk to the park, prefer a grass field (one field if possible) and they come to the park mainly to walk on the trails. They have lived there for several years and are concerned about an increase in traffic. The residents of the broader community have different needs. They tend to drive to the park (therefore requiring more parking and prefer two fields). The main reason they visit the park is to use the sport fields. The proposed two field option would address their needs better than the current situation or the one synthetic field option. It is important to keep in mind that the survey results for the first public information session reflect mainly the nearby residents' opinions whereas the survey for the second public information sessions reflects a majority of the broader community's views, with their differing priorities.

8.9 Project Timeline

For an overview of public consultation to date, please refer to the timeline on the following page.

Figure 8-7 - Project Timeline

9 CONSTRUCTION COSTS

We have prepared a preliminary cost estimates for the following options:

1. Option A – One Synthetic Field Plus Warm-up Area (River Sand Preload)
2. Option A – One Synthetic Field Plus Warm-up Area (Clean Fill Preload)
3. Option B – Two Side by Side Synthetic Fields (River Sand Preload)
4. Option B – Two Side by Side Synthetic Fields (Clean Sand Preload)
5. Option C – Natural Grass Field
6. Option D – Two Separated Synthetic Fields Plus Warm-up Area
7. Environmental Compensation (applicable to Options A, B and D)

With respect to the use of clean fill as preload; while cost savings can be realized, it is noted that the feasibility will be subject to having a large source of clean fill. Furthermore, the schedule will be impacted substantially, (potentially by several years) while fill is being placed. Long term monitoring of clean fill placement and inspection of fill to ensure the material is clean and suitable are costs that have not been factored into these estimates.

The estimated cost for the environmental compensation work has been completed by Envirowest Consultants Inc. The cost breakdown can be found in their report.

Please refer to the table on the following page for a summary of the cost of each option, along with the relative cost-based advantages and disadvantages.

Summary of costs:

Option	Cost	Pros (Cost-based)	Cons (Cost-based)
A (One lit STF with Practice Area)	$6.2 M	No tree removal/ replacement work Reduced environmental compensation costs No road work No utility relocation costs	Preload req'd Settlement repair risk
B (Two lit adjacent STFs)	$11.2M		Preload req'd for 2 fields Longest preload period Ongoing settlement risk Higher repair risk Tree removal and replacement work Full environmental compensation costs Access road and utility relocation costs
C (Natural Grass Field)	$1.9 M	No tree removal/ replacement work No environmental compensation costs No utility relocation costs	Ongoing settlement Ongoing maintenance
D (Two separated, lit STFs with Practice Area)	$8.7 M	No preload for 1 field No settlement risk for 1 field No access road or utility relocation costs	Preload req'd for 1 field Ongoing settlement risk Higher repair risk Tree removal and replacement work Full environmental compensation costs
Environmental/Habitat Compensation Work (Required for Options B + D)	$1.3 M		
Use of Clean Fill vs Sand as preload		Savings of up to $0.8M	Longer duration Inconsistent materials Material availability risk Greater risk of erosion

The above estimates can be found in Appendix I.

10 CLOSING

We trust you find the above suitable for your needs. Should you have any questions or comments on the information contained herein, please do not hesitate to contact the undersigned.

Prepared by:

Catherine Eiswerth
Manager, Landscape Architecture,
Sports & Recreation

Reviewed by:

Matthew Harbut, MBCSLA
Landscape Architect

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APPENDIX F

PRESENTATION BOARDS

PUBLIC INFORMATION SESSION #2

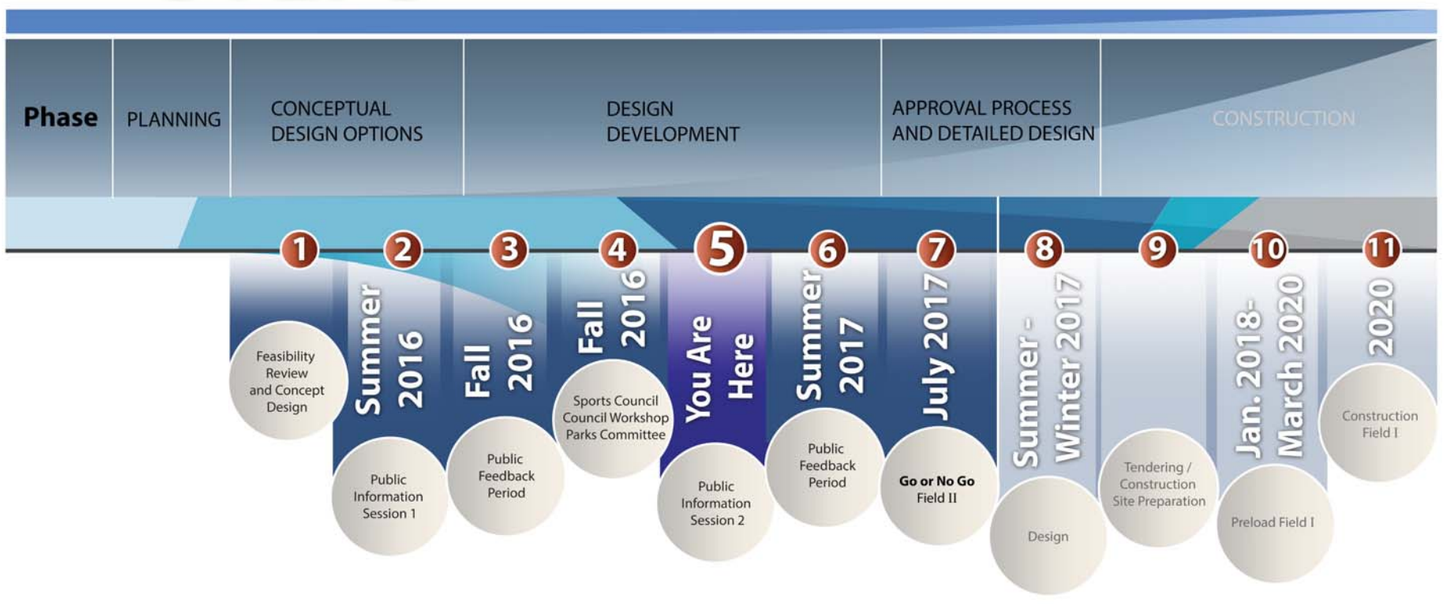
Welcome & Introduction

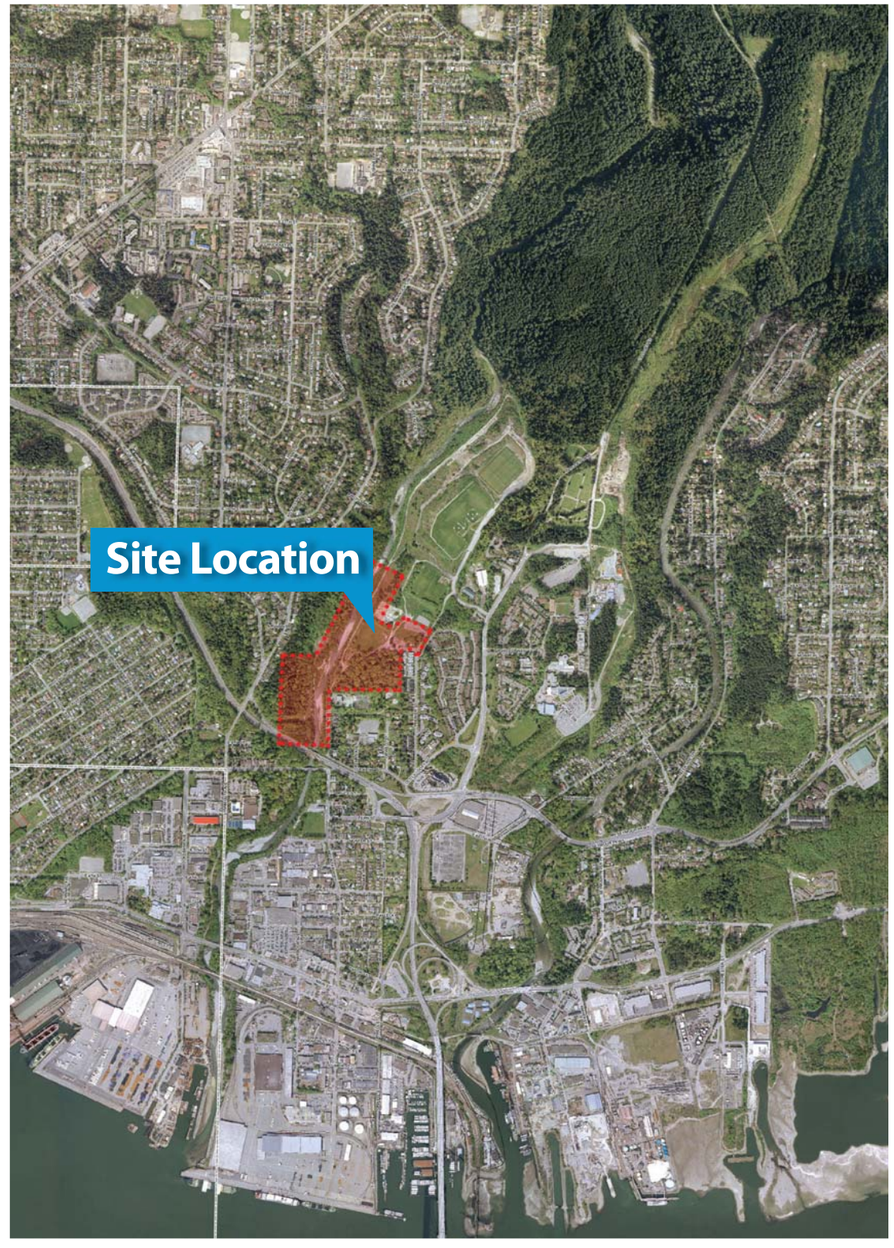
NORTH VANCOUVER DISTRICT

Inter River Park Sports Field Public Information Session

- Public feedback is critical to planning a successful park!
- Please review the boards and provide your comments and ideas
- Tell us what you like, what you don't like or what is missing
- Fill out a survey form or speak directly with the project team

11 STEPS





BINNIE

Project Background

Study Area

The study area is located at the south end of Inter River Park, and includes Field #1, as well as surrounding wetlands, forests, roads/parking, trails and the District nursery and caretaker's residence.

Intent

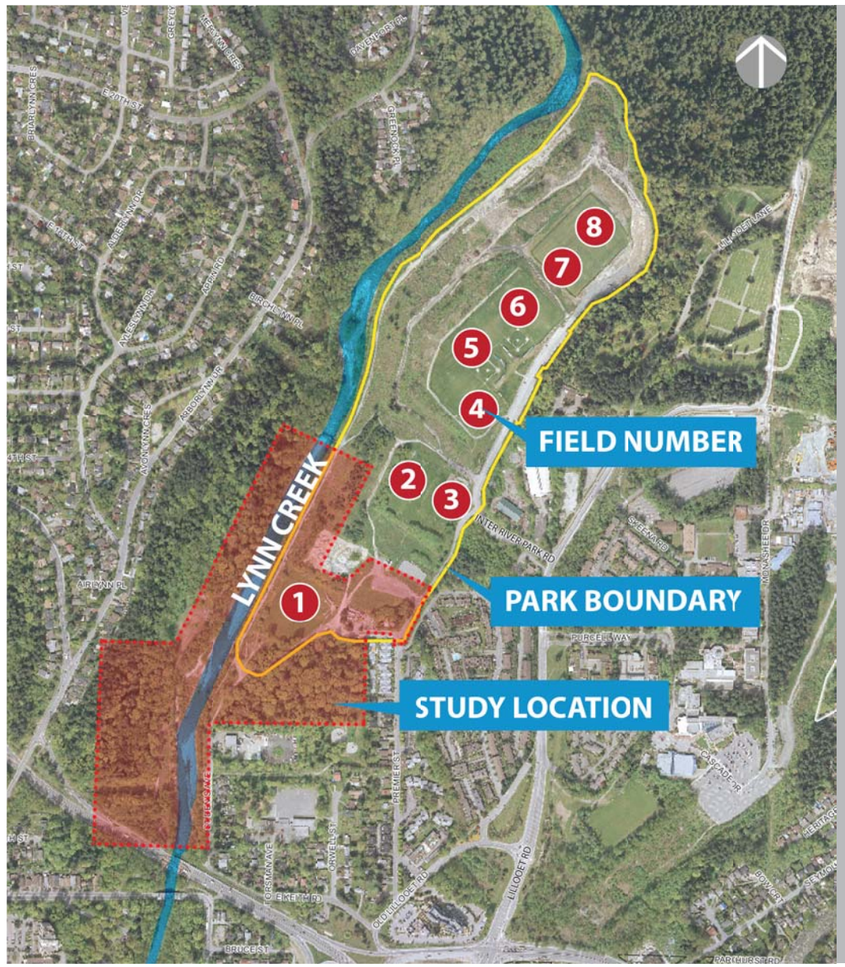
The intent of this project is to explore options for providing additional sports field inventory at this location, while minimizing impacts to the environment , adjacent uses and neighbours. Guided by the Inter River Park – Lillooet Park Recreation Use Study, 1995, the park has been developed as a regionally significant, multi-venue athletic facility with multiple sports fields, a lacrosse box and a bike skills park; connected by popular trails with access to adjacent natural features such as Lynn Creek.

Demand for Increased Sports Field Inventory

The existing grass field (Field #1) has been substantially compromised due to settling of the field and associated infrastructure (e.g. backstops and dugouts), largely as a consequence of constructing the field over a former landfill site. The field's uneven surface and associated drainage issues limit the playability and as a result the field is only booked occasionally. Compared to other District sports fields, the field is underutilized, unsafe for play, and will require a full restoration to make it suitable to meet its full scheduling capacity.

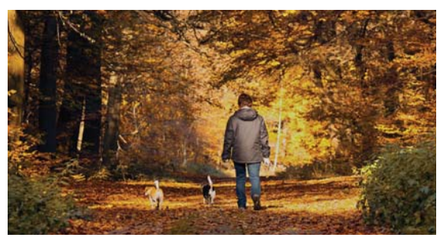
A new full size artificial turf field, accommodating soccer, football and field hockey, is proposed for Inter River Park. This new field would meet the objective of developing Inter River Park as a sports tournament center, as well as providing additional artificial turf inventory to take the pressure off existing grass fields throughout the District.

A new sand-based natural grass field cannot match the potential user hours of a artificial grass field.



HISTORY OF INTER RIVER PARK

- Landfill from 1956 to 1988
- Soil Disposal site from 1990 to Current
- Park Development Initiated in 1988 – 2009
- Inter River Parks Master Plan approved in 1995
- New sports fields, roadways, parking, trails, Bike Park, Habitat planting and Morten creek enhancement
- Fields **1** - Opened 1988
- Fields **2, 3** - Opened in mid 1990's
- Fields **4, 5, 6 -** Opened 2005
- Fields **7, 8** - Opened 2009



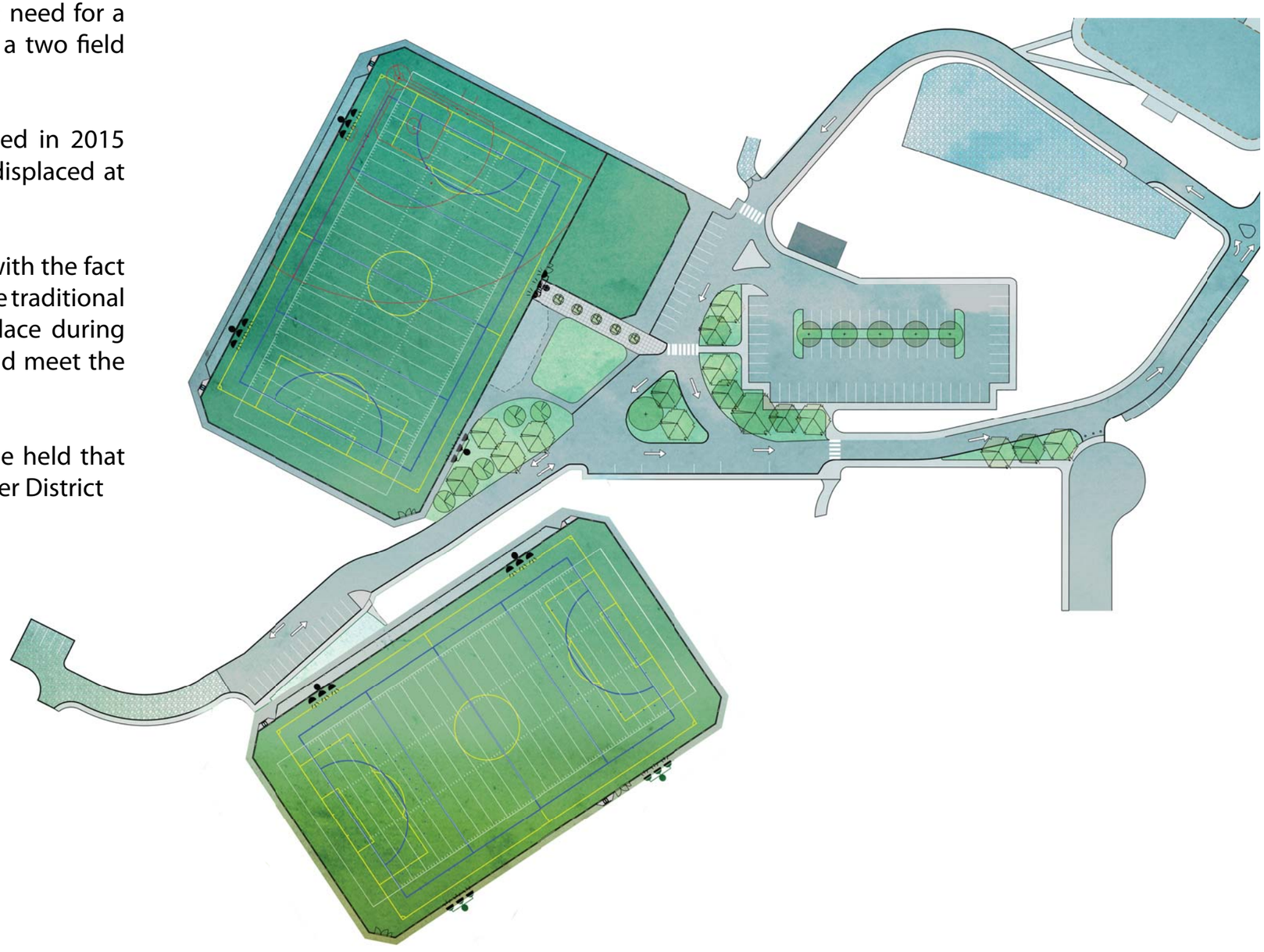
Why Two Fields?

- The Sports Field Needs Assessment 2017, identified a need for a tournament facility at Inter River Park which includes a two field ATF facility

- The Seylynn and Bridgman Park Masterplan completed in 2015 identified the need to replace the sports field being displaced at Seylynn with a new field at Inter River Park

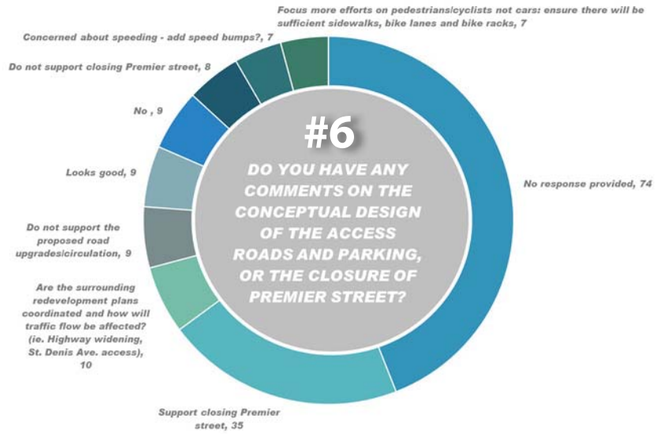
- Given the high rainfall on the North Shore, combined with the fact that one ATF can provide roughly 4 times the usage of one traditional grass field, and that games and practices can take place during inclement weather, means that having two fields would meet the need in our climate

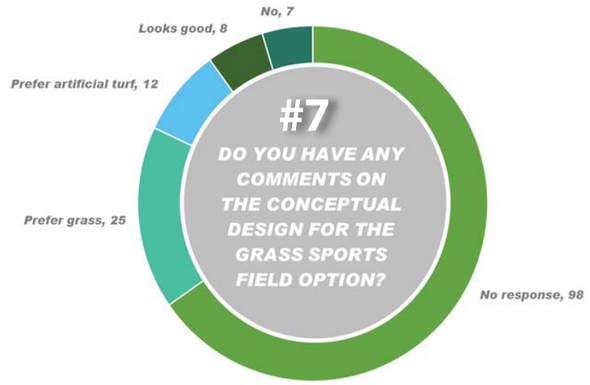
- A two field configuration allows for tournaments to be held that may not currently be accommodated in North Vancouver District

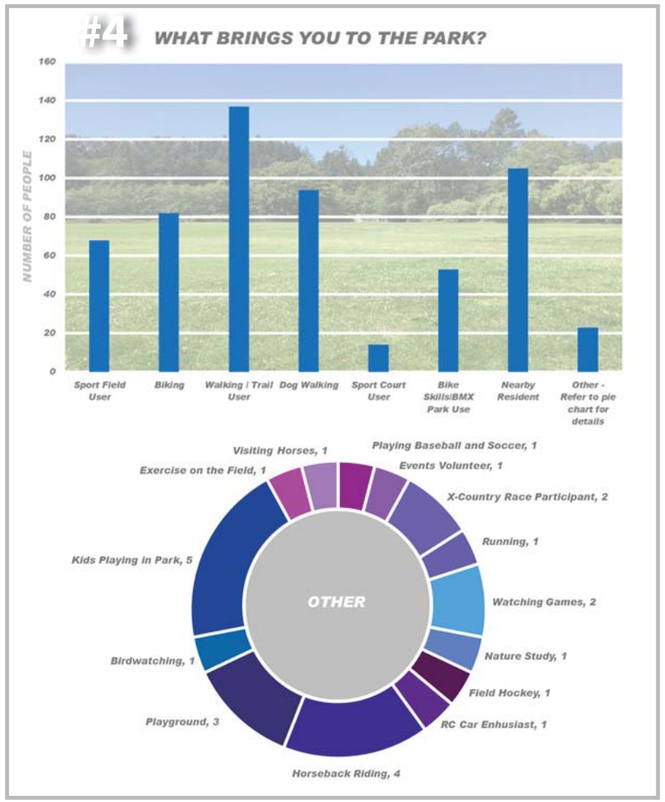


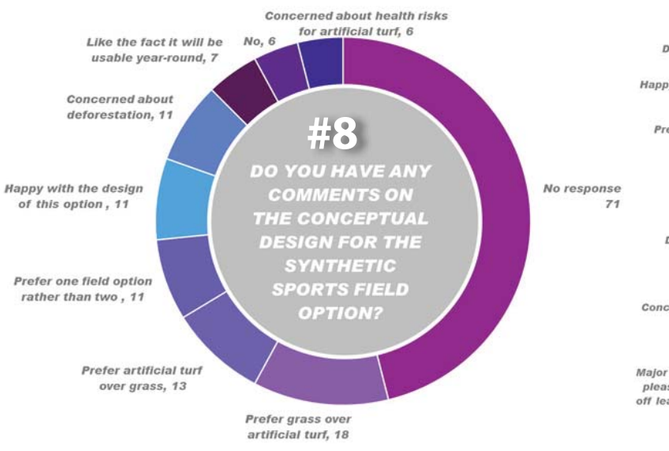
Public Consultation

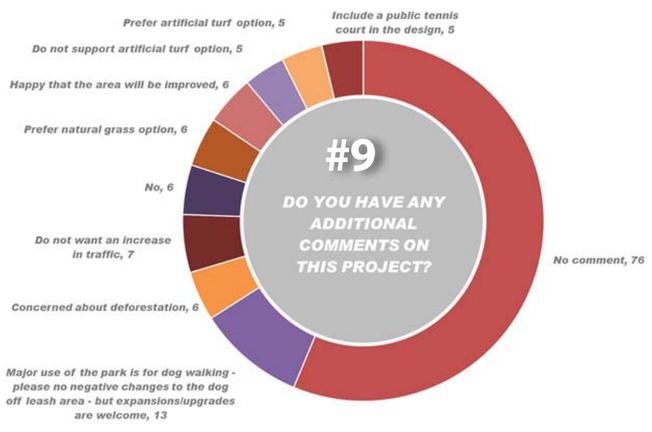
A public open house was held on August 31, 2016. Feedback was collected by survey in both hardcopy format and on the DNV website. There were 176 responses and the results are summarized below:

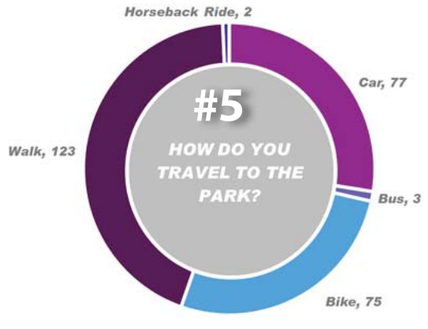












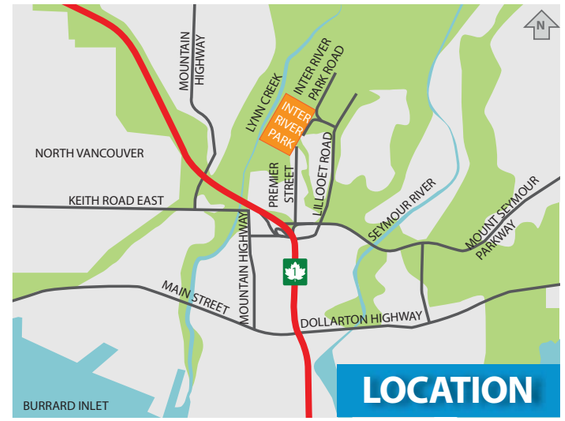
Questions 6-9 have been tabulated to reflect a categorization of the responses. For example, '3-Pleased with overall design' means that there were three comments of a similar nature expressing the persons' satisfaction with the proposed design. In order to provide a concise overview, only topics that 5 or more people supported have been included.

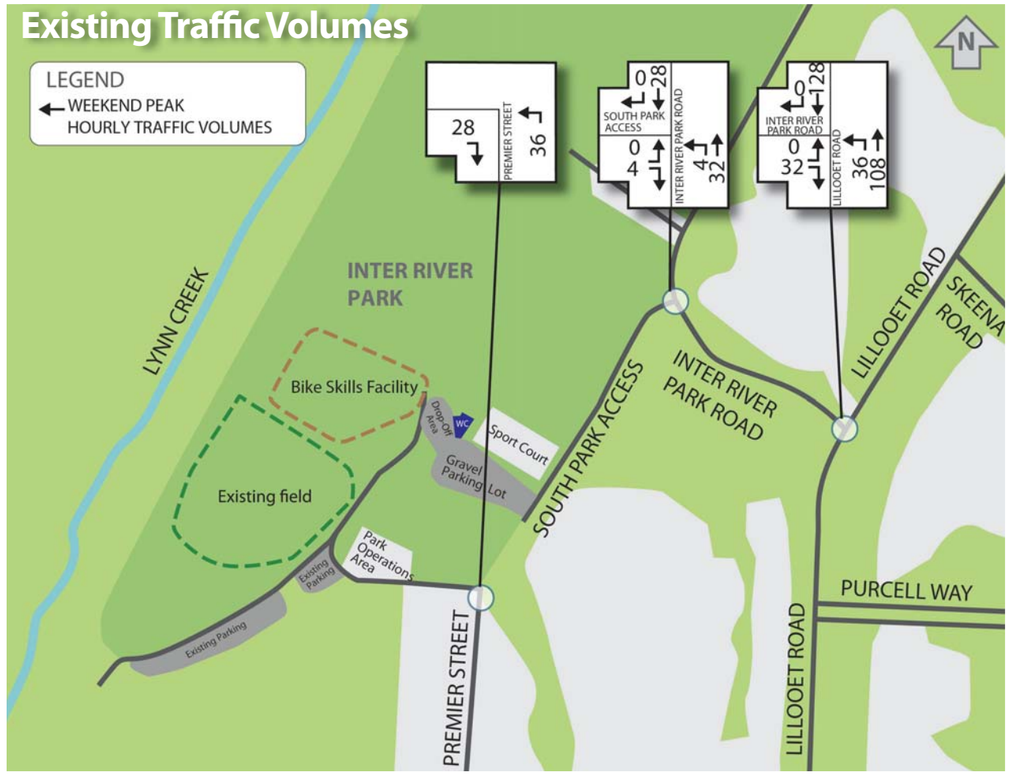
Traffic Analysis

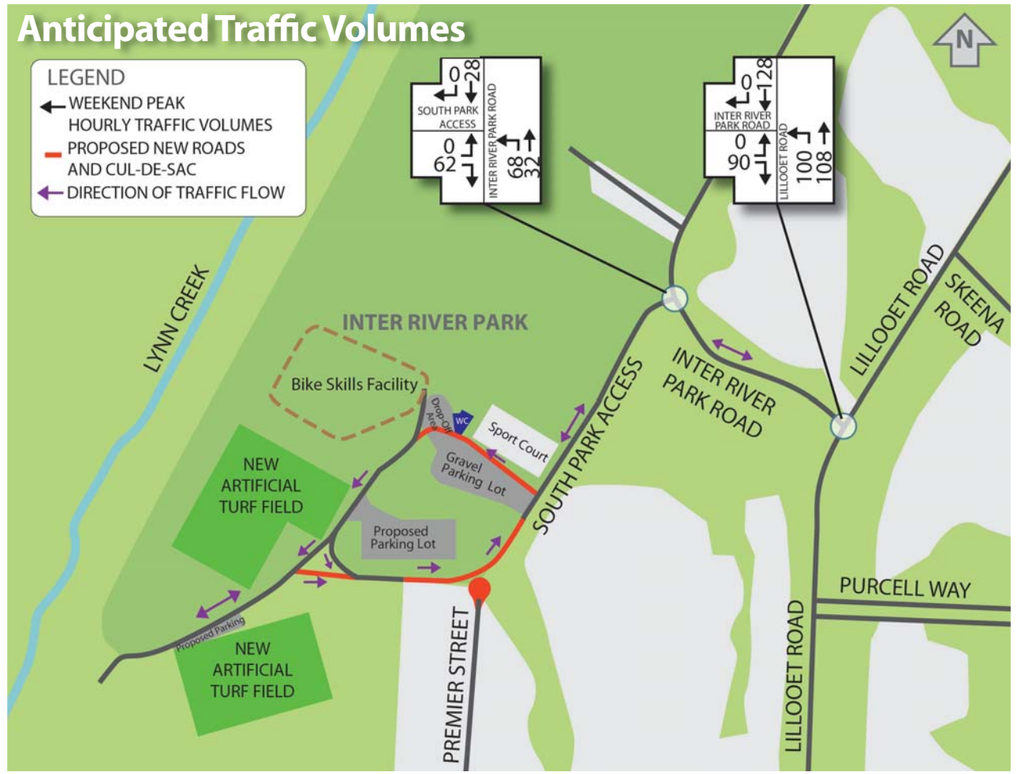
A new road and additional parking spaces are proposed for the users of the new artificial turf field (ATF) and park visitors. Changes to the existing traffic circulation are as follows:

- Access to the park off of Premier Street will be closed to vehicles and a cul-de-sac will be constructed to provide turnaround opportunities. Cyclists and pedestrians will still be able to access the park from Premier Street. There will also be an emergency access at the end of the cul-de-sac with a gate.
- As a result, vehicle access to the park will be provided from Inter River Park Road via Lillooet Road. There will be a one-way circulation loop to provide efficient traffic flow through the parking areas and minimize vehicle conflicts.

It was estimated that each proposed artificial turf field will generate 29 new vehicle trips during the weekend peak hour, (totalling 58 for both fields) with a peak parking demand of 162 vehicles.



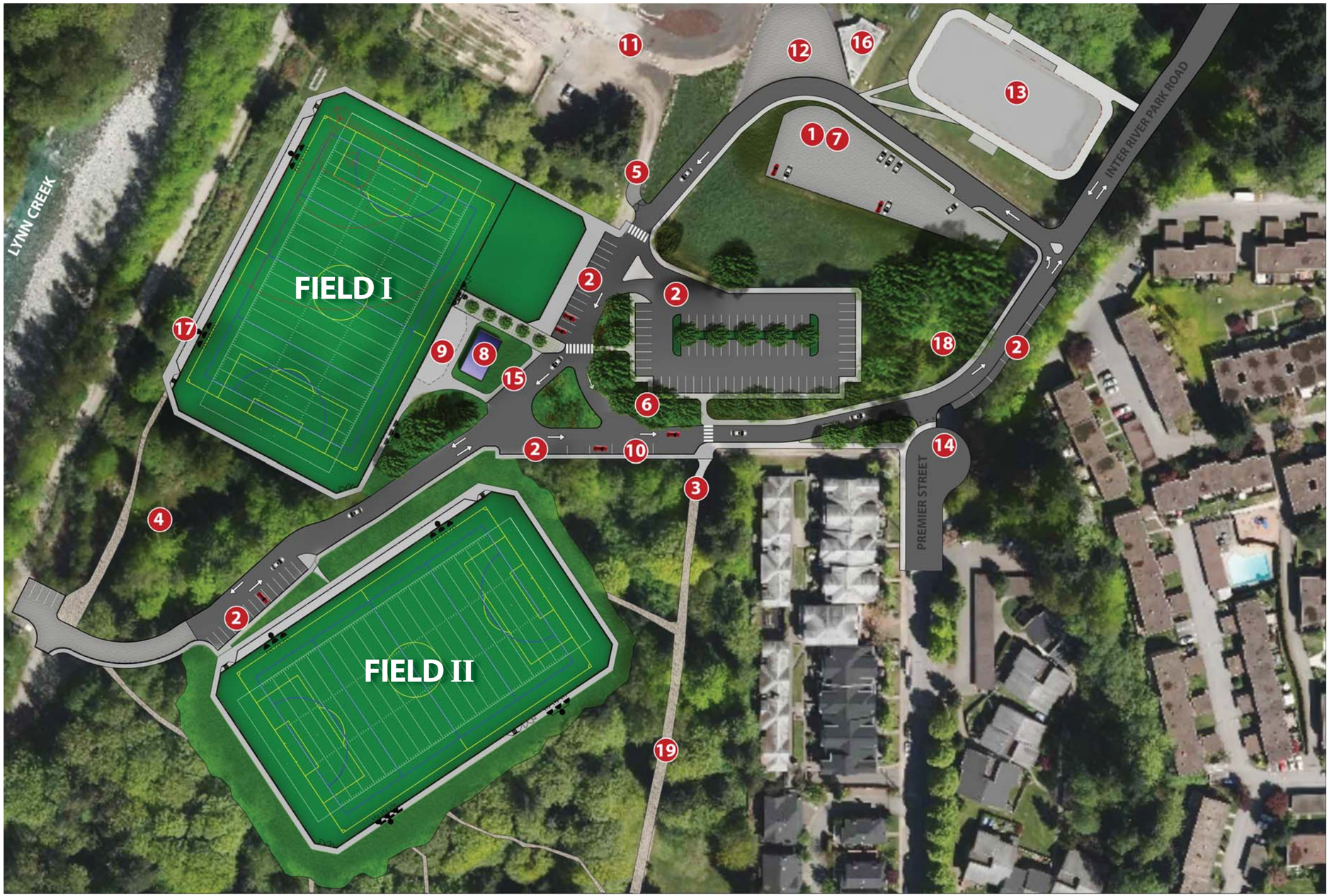




In order to serve pedestrians and cyclists, the access road will be wide enough to support cyclist and vehicular traffic, and sidewalks will be built which tie into existing sidewalks on Inter River Park road.

Artificial Turf Field

NORTH VANCOUVER DISTRICT



LEGEND

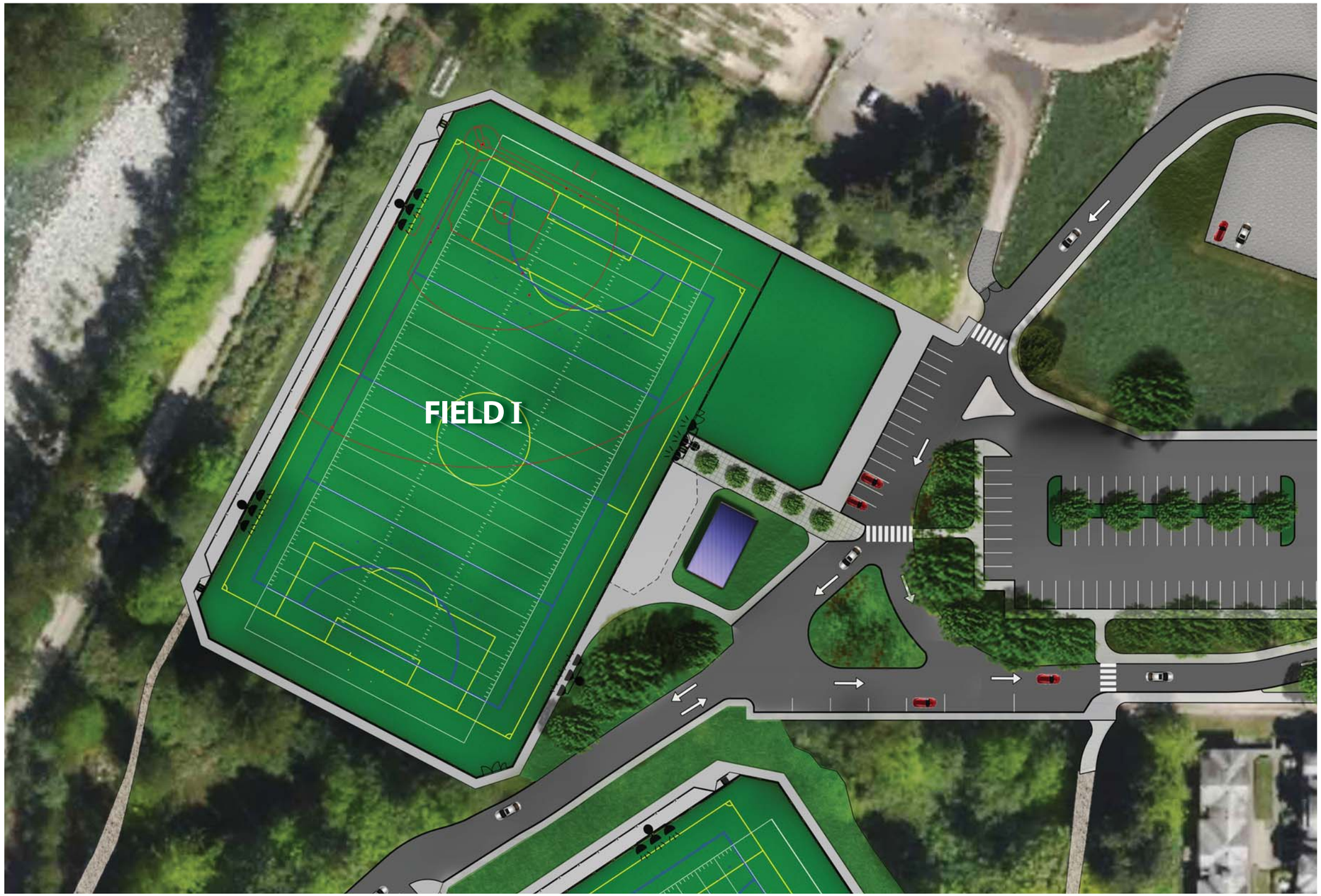
1) Existing parking
2) Proposed parking areas (162 total - 150 ninety degree / 12 parallel)
3) Existing trail entrance
4) Existing sedimentation pond
5) Service vehicle access
6) Existing trees preserved
7) Parking and event staging area
8) Future potential field house and washroom location
9) Spectator area
10) Bus parking stalls (2)
11) Existing bike skills facility
12) Bike skills park drop-off area
13) Future sport court (by others)
14) Emergency access
15) Proposed drop-off area
16) Existing field building/ washrooms
17) Proposed field lights
18) Future park operations area
19) Existing trail

Inter River Park

South Sports Field Feasibility and Conceptual Design Option D

BINNIE

Field Qualities



FIELD I

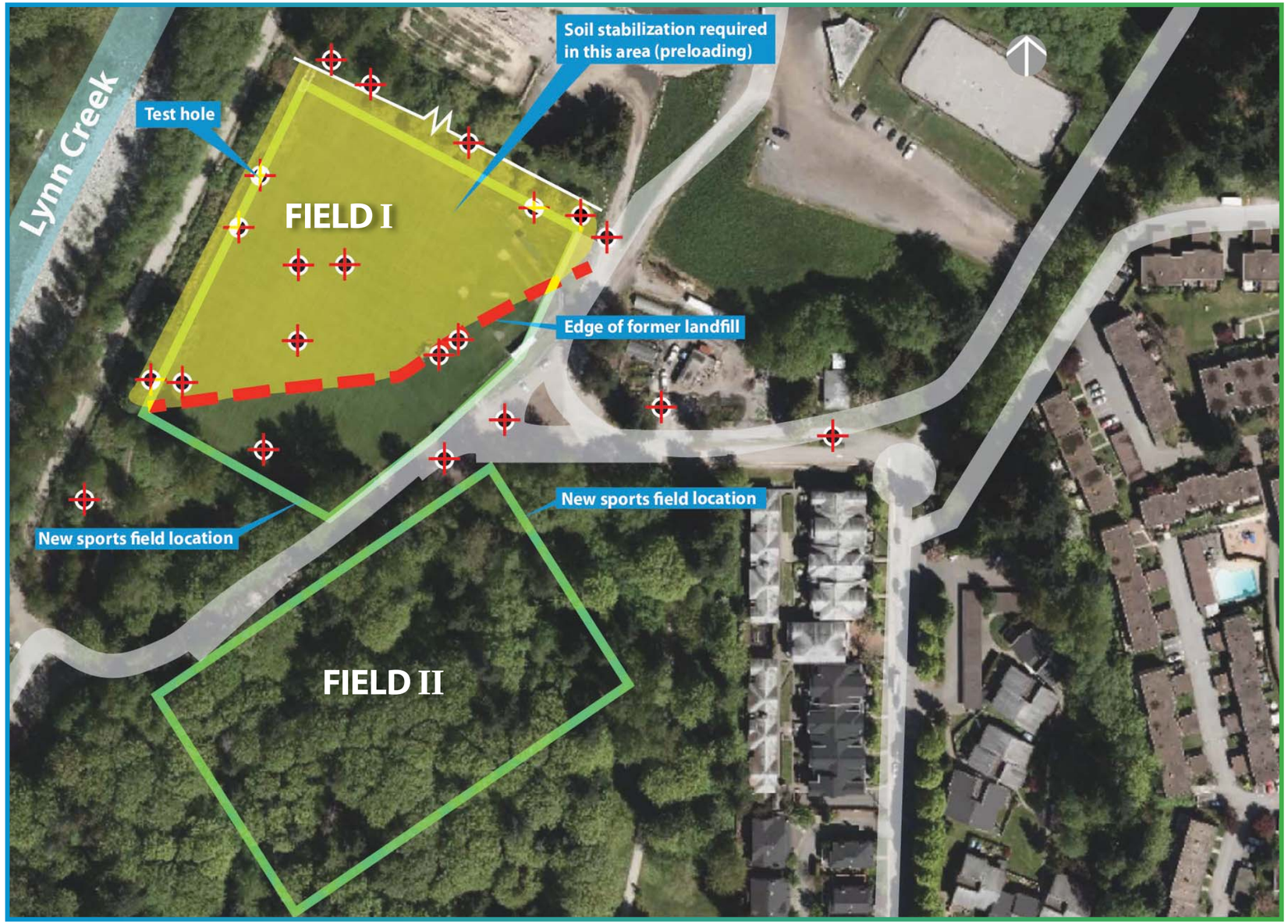
- Minimal tree removal/habitat loss
- Minimal riparian encroachment
- Some settlement potential
- Preload required, which results in longer construction duration
- Future maintenance risk
- Infrastructure upgrades are required
- Re-organized parking for public safety
- Parks Operational Compound impacted

Field Qualities

FIELD II

- Requires removal of 130 trees, which is 1.5ha of forested parkland out of 4.5ha (one third total). However, 27% of these trees are in poor condition, dying or dead states of health.
- 390 replacement trees will be required.
- Does not require preload, so the construction duration would be shorter than for Field I
- Infrastructure upgrades required

Geotechnical Overview



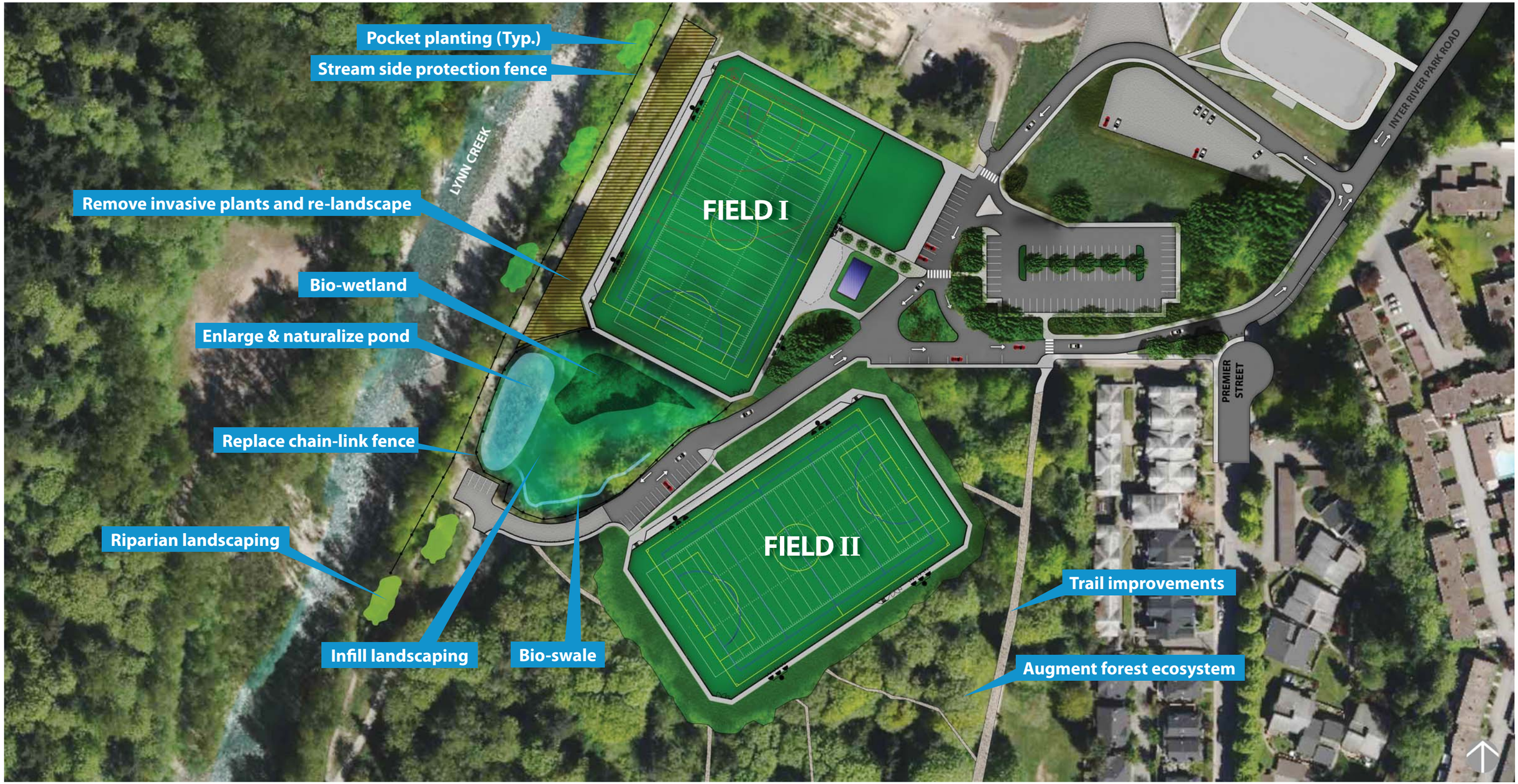
Different Geotechnical Conditions

As field I would be located on a former landfill, this presents additional challenges. Preloading is required, which will increase the construction duration. Additionally, there is the risk of future field settlement.

Field II is outside of the former landfill boundary and will not require any preloading.

Proposed Habitat Enhancements

NORTH VANCOUVER DISTRICT



Inter River Park

South Sports Field Feasibility and Conceptual Design Option D

BINNIE

Environmental Improvements

Note: Photos 1-23 reflect current conditions and were taken on May 2, 2017

1-3, 5-6) Infill rip rap planting

4) Maintain beach access

7) Infill rip rap planting/remove invasive blackberry

8) Infill rip rap planting

9) Re-vegetation/Infill rip rap planting

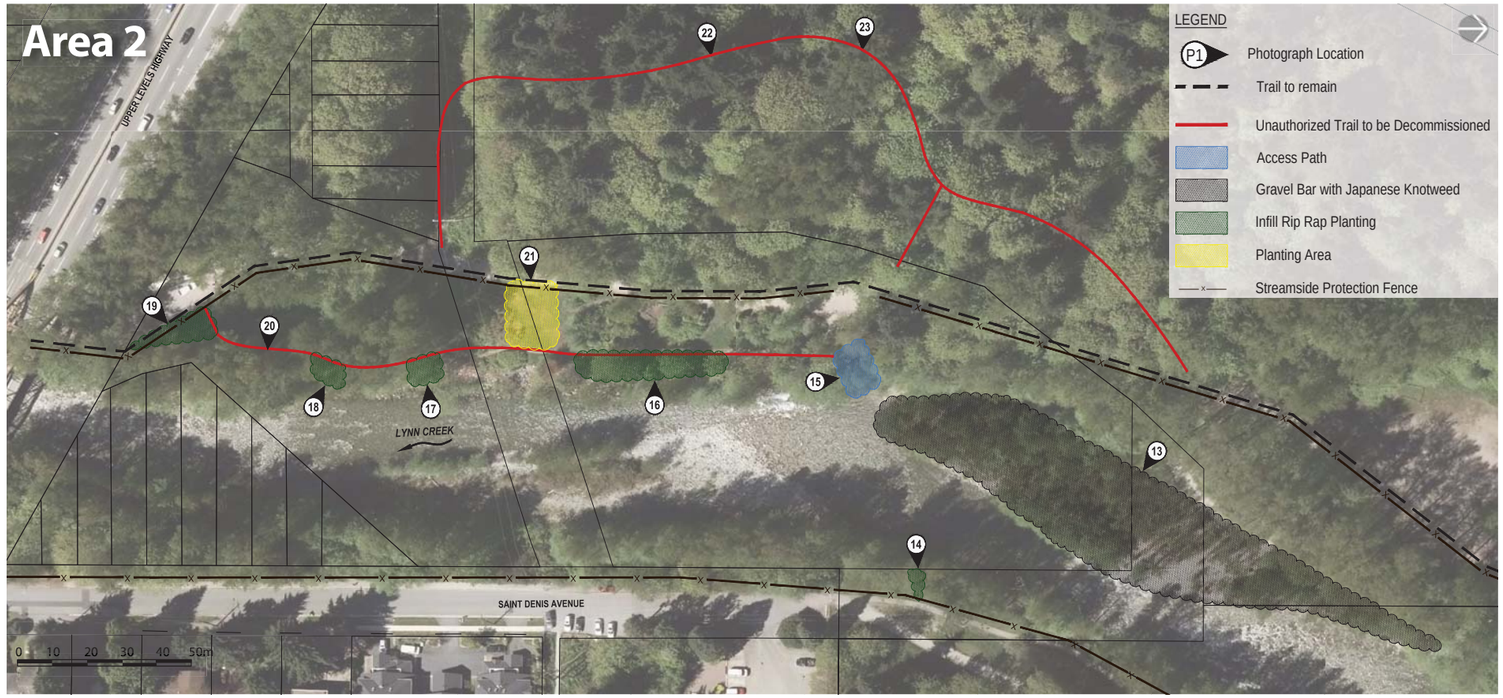
10) Maintain beach access

11) Remove shelter and invasive species and re-vegetation

12) Restoration planting

Green Parking Examples

Environmental Improvements



Note: Photos 1-23 reflect current conditions and were taken on May 2, 2017

13) Remove Japanese Knotweed throughout gravel bar

14, 16 - 18) Infill rip rap planting

15) Maintain beach access

19) Restoration planting

20) Decommission trail restoration planting

21) Restoration planting/ knotweed removal

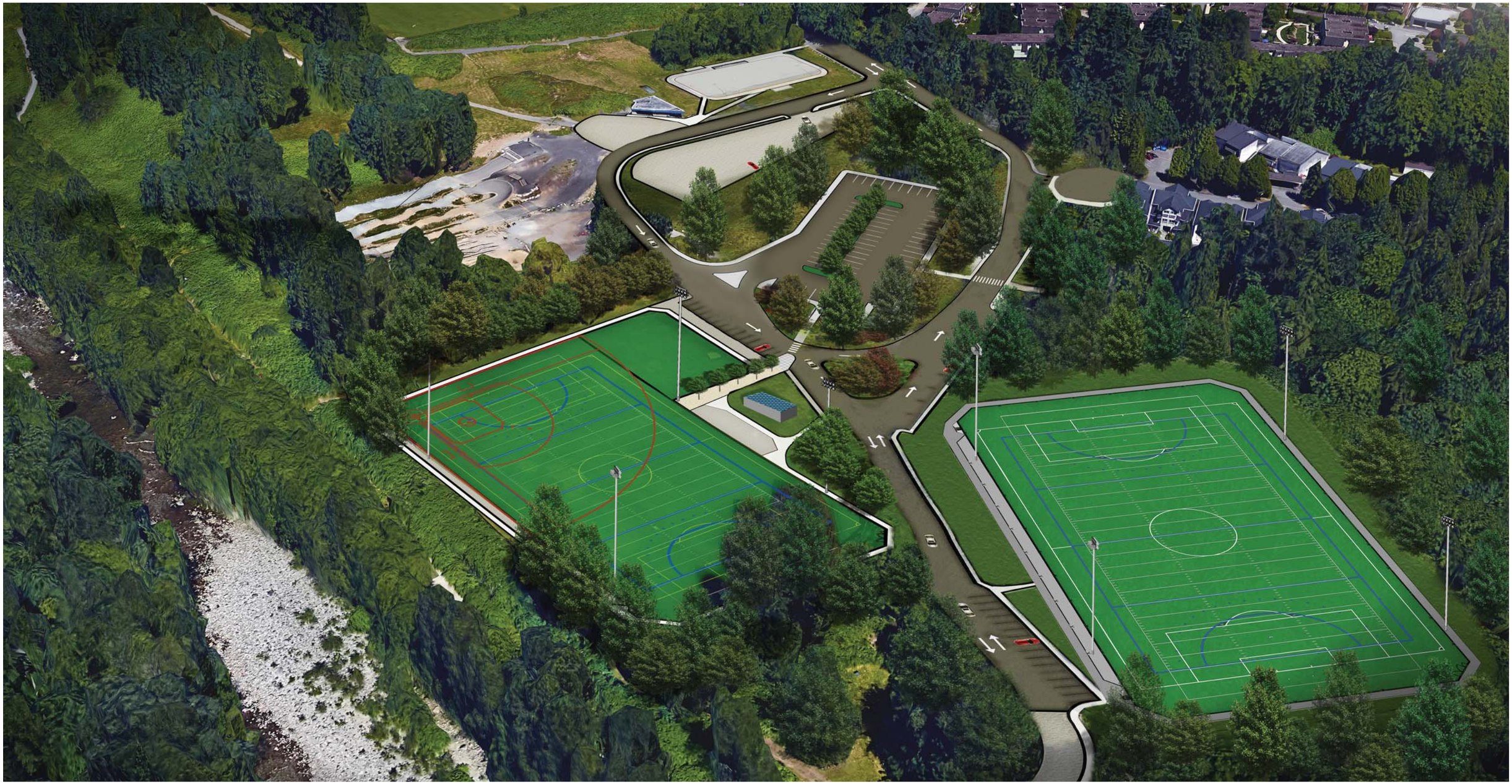
22) Restoration planting

23) Remove makeshift bridge

Bio Wetland Examples

Aerial Perspective

NORTH VANCOUVER DISTRICT



Inter River Park

South Sports Field Feasibility and Conceptual Design Option D

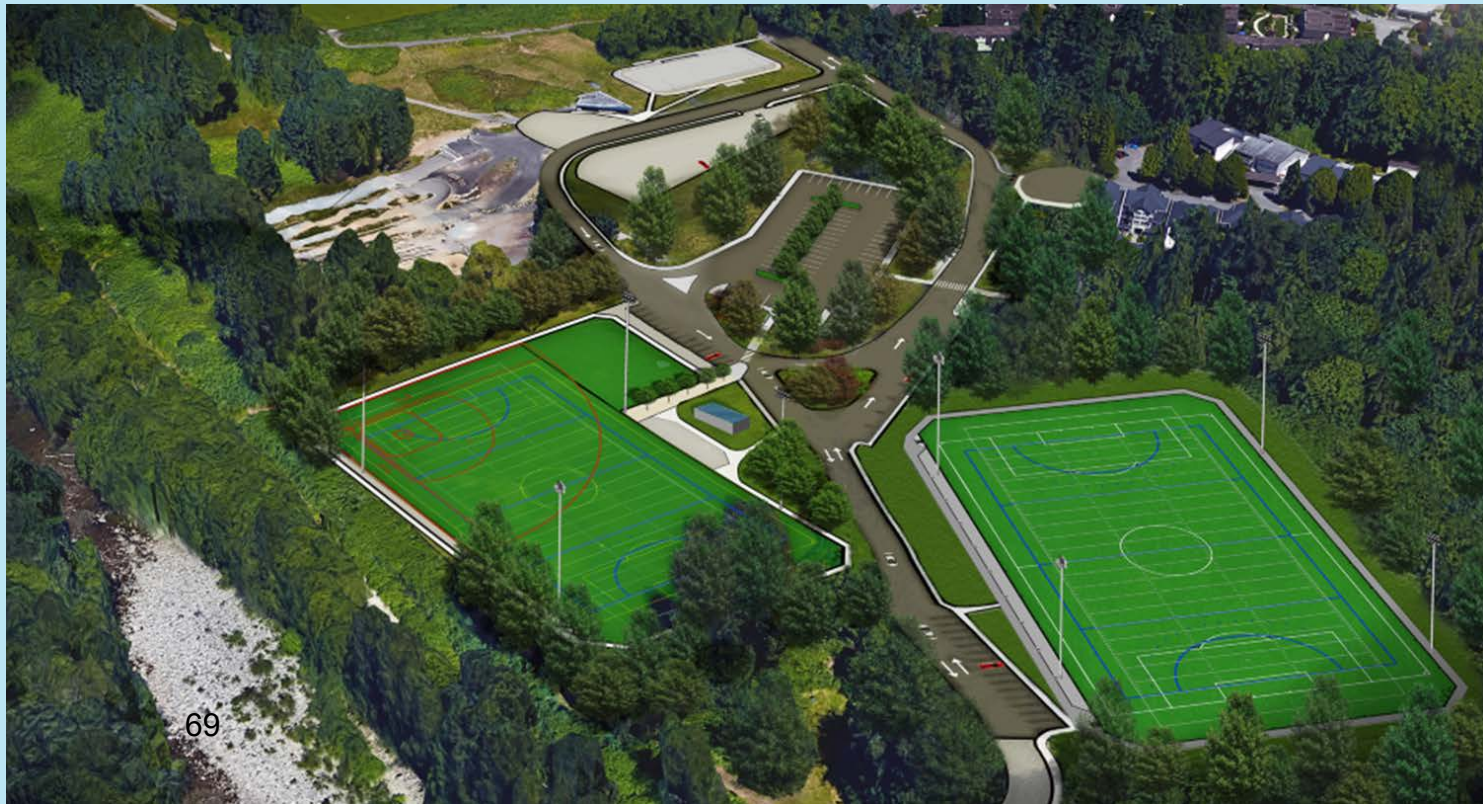
BINNIE

Sports Field Program

Inter River Park, Argyle School ATF & Kirkstone ATF Conversion

Council Workshop | November 14, 2017

Presented by:
Douglas Rose, Section Manager, DNV Parks
Carolyn Girard, Park Planner, DNV Parks



Agenda

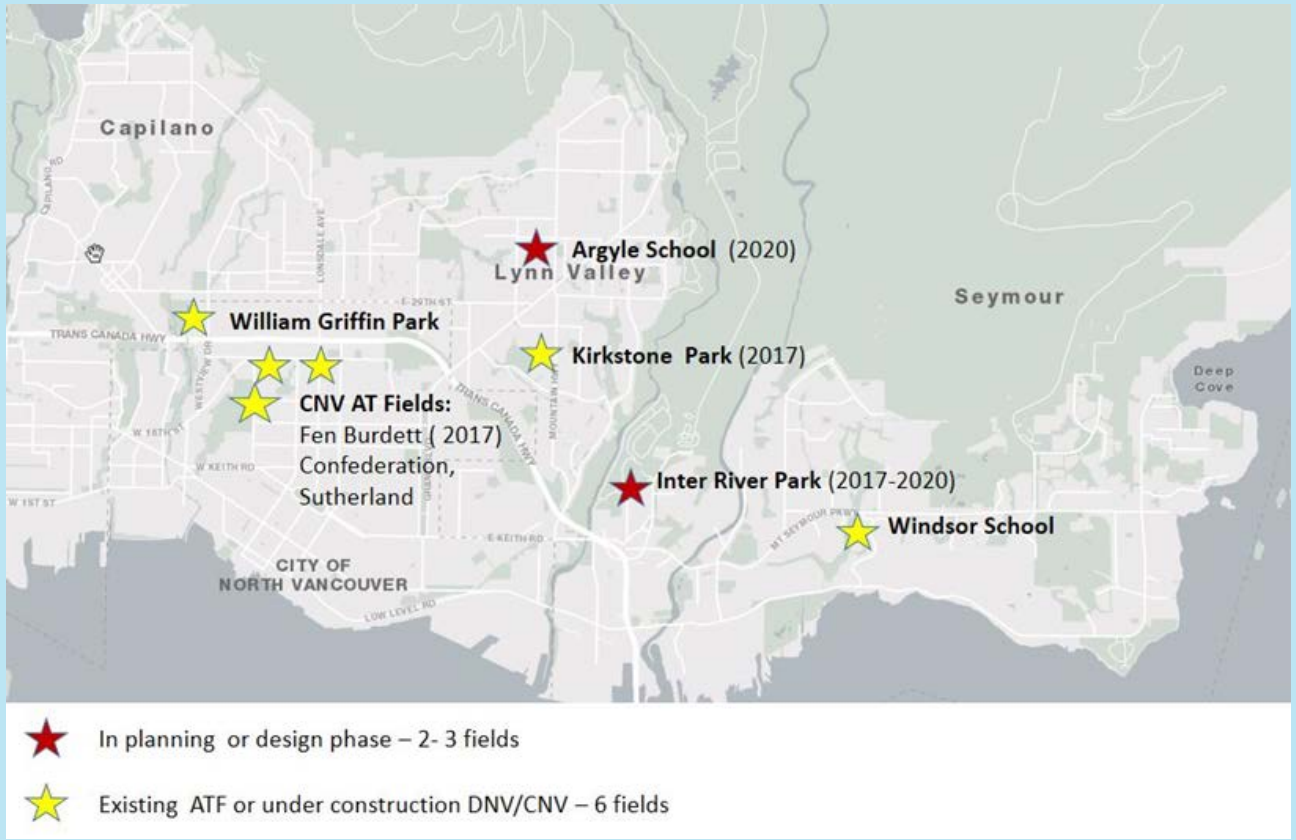
1. Background of Sports Field Program
2. Financial Strategies
3. Inter River Park ATF Feasibility
4. Kirkstone & Argyle Status Updates
5. Questions

Background: Sports Field Program

Existing DNV Sports Field Capacity Challenges:

- Kirkstone and Fen Burdett will add 6,000 hours of capacity in 2017
- Need for additional hours to be confirmed, next 3 priorities add 8,800 hours of ATF use

Field Sites	Anticipated Hours of Play
Kirkstone Park	3,000
Fen Burdett (CNV)	3,000
New capacity in 2017	**6,000**
DNV Priority fields	
Inter River Field #1	3,000
Inter River Field #2	3,000
Argyle School	2,800
Additional capacity	**8,800**



Financial Strategies

Context

- Limited funding for over $50m in improvements outside centers over next 10 years
- Flat registration last 5 years, increased hours allocated to change in service levels and future growth
- Cost recovery rate is low
- Sport groups open to changes in user fee rate structure
- Teams may already be paying market rates for some hours outside of NV
- Change in fees likely not material on a per player per season basis
- Adults have a high subsidy rate

Five Year Capital Plan

		Capital Cost M$	Field Hours	DNV	Sports User Share
Option 1	Inter River – Field 1	$6.2	3,000	60% of costs **$5.8m**	40% of costs **$3.9m**
	Argyle Field	$3.5	2,800		
		$9.7	**5,800**		
Option 2	Inter River – Field 1	$6.2	3,000	60% of costs **$8.1m**	40% of costs **$5.4m**
	Inter River – Field 2	$3.8	3,000		
	Argyle Field	$3.5	2,800		
		$13.5	**8,800**		

Cost shares:

- DNV: 100% site preparation and environmental and 50% fields
- Sport user: 50% fields

Funding:

- DNV: Grants, DCC's, local area CAC's, utilities, tax growth
- Sport User: user fee (e.g. 75% subsidy youth, 25% subsidy adult), capital contribution, other

Background: Inter River Park ATF Feasibility and Conceptual Design

Key Dates:

- Public Information Session 1: August 2016
  - Options A, B and C presented
- Council Workshop 2: October 2016: Staff directed to:
  - Implement Option A
  - Pursue other options for 2nd adjacent ATF field
- Public Information Session 2: June 2017
  - Option D presented

Option D: 2 separated ATFs + practice area

Pros:

- Additional lit ATF inventory (6,000 hours of annual play)
- Larger tournament capability
- Potential new fieldhouse to accommodate variety of users
- Advantage over Option B (2 side-by-side ATFs)
  - minimize differential settlement
  - reduced construction cost and impact (utilities, access road)
  - Allows for staging of field construction

Cons:

- Environmental, visual and health impacts
  - Habitat loss
  - Removal of approx. 130 trees (rare floodplain forest)
- Loss of well used informal and natural parkland
- Increased traffic, noise and field lights

Cost Comparison

- Option A: 1 ATF plus practice area: $6.2m
- Option D: 2 separated ATFs plus practice area: $8.7m
- Environmental Compensation (Option D): $1.3m

Park Access and Transportation Impacts

- 162 parking spaces (including bus parking)
- Improved access, circulation and drop-off (Premier Street closed with cul-de-sac)

Public Information Session 2

June 2017

1288

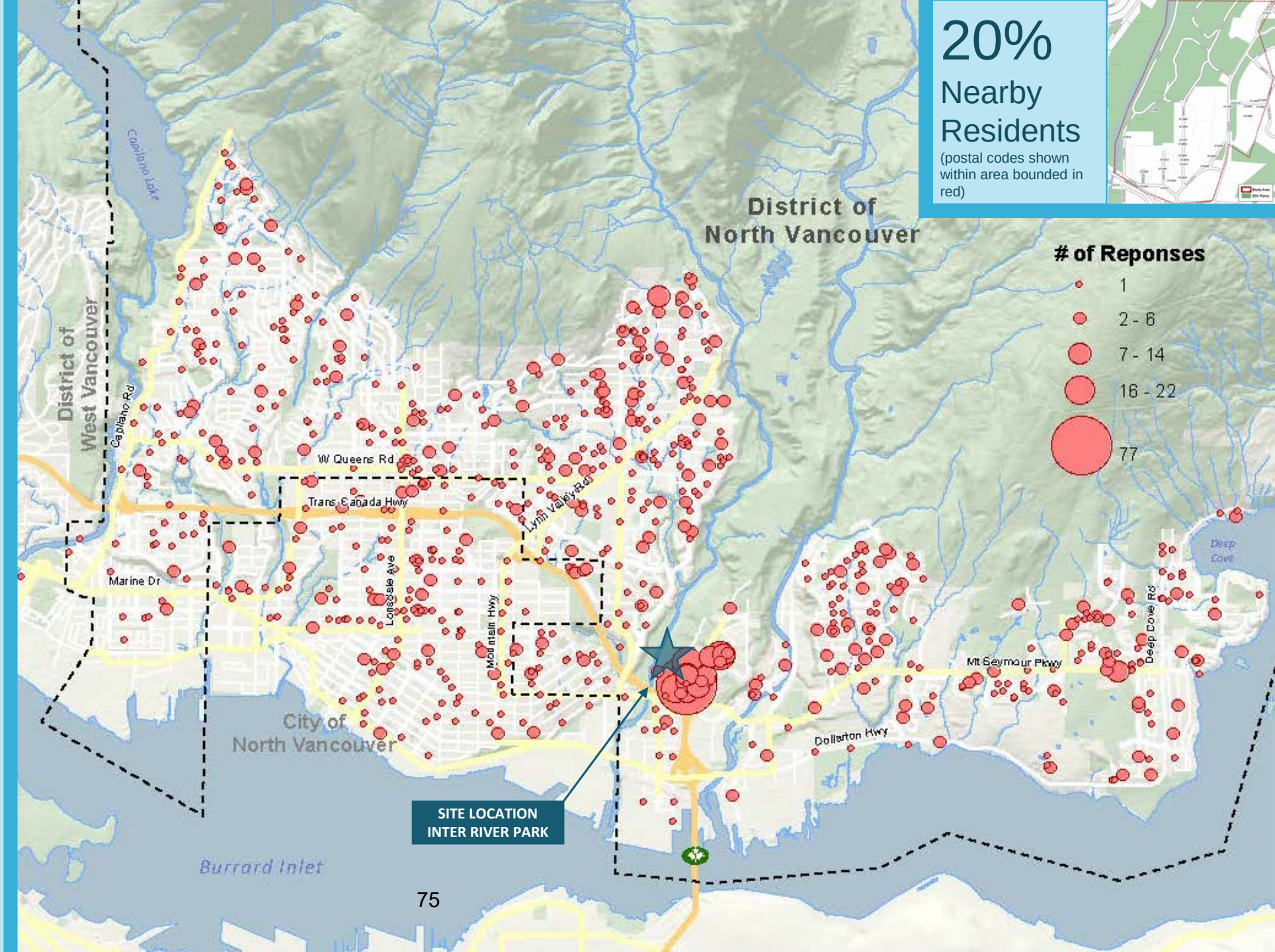
Survey Responses

(considered valid and complete)

- not statistically relevant
- not representative sample

79% DNV

16% CNV



Key Themes from Comments

Concerns about loss of park space and forest removal:

- Well used by the community, local school and families (all ages, abilities and incomes) throughout the seasons for informal, natural, imaginative and physical, play; walking, running, biking; environmental education, nature appreciation, relaxation

- Rare floodplain forest (trees, shrubs and wildflowers) provides shade, improves air quality, reduces carbon footprint; provides habitat for animals, amphibians, birds

- Provides visual and sound buffer between Digger Park / adjacent residents and sporting events in Inter River Park, highway and new towers. So much forest has already been lost for fire training centre, highway and road expansion, new developments, etc.

Concerns about ATF field:

- Environmental and health impacts; additional vehicular traffic; increased noise and light pollution; loss of ‘natural’ grass field for informal use; build ATF field in a location that’s already disturbed (e.g. school sites for maximum use); spread ATF fields out

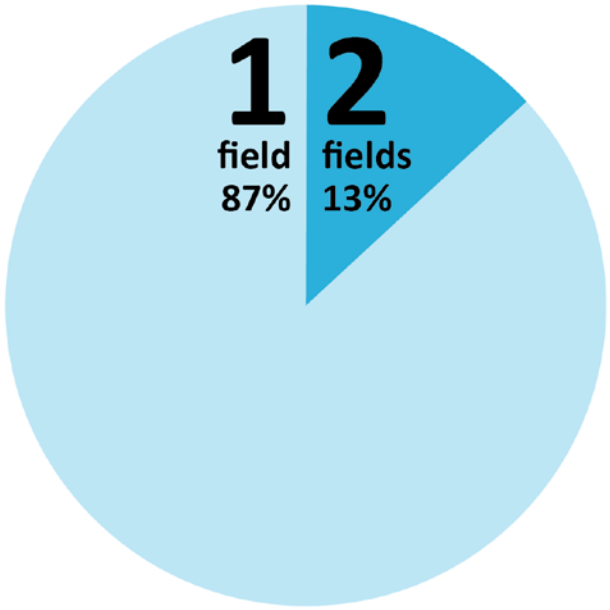
Key Themes from Comments

ATF fields and fieldhouse:

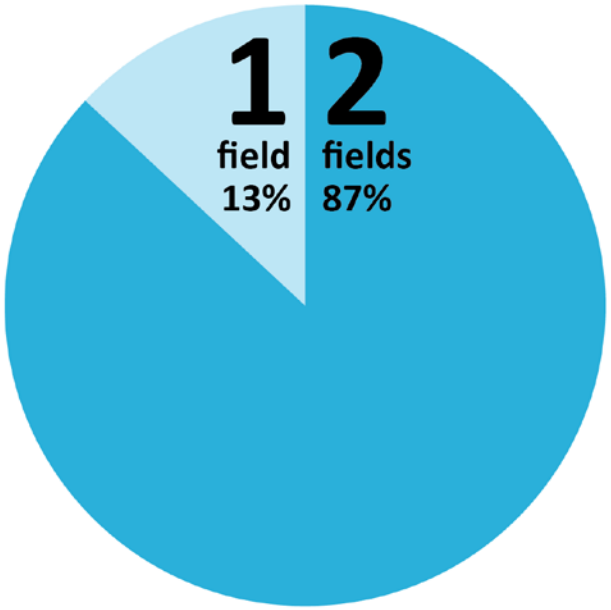
- Need for additional ATF fields to meet current and future demand for practices and games in rainy and snowy weather, and at convenient times; to keep kids interested, attract more players, and stay competitive
- Health and social benefits of active living, team sports and life skill development for all ages at a reasonable price
- Ability to host tournaments and events with economic benefit to District. Good location with an existing tournament facility, centrally located in North Vancouver, and easy access Highway 1
- Clubhouse provides a home for NVFC; possibility to purchase and consume food and drinks; and stay dry watching games and practices
- Accommodate other sports (e.g. baseball , field hockey, football); health concerns of crumb rubber;

Survey Responses

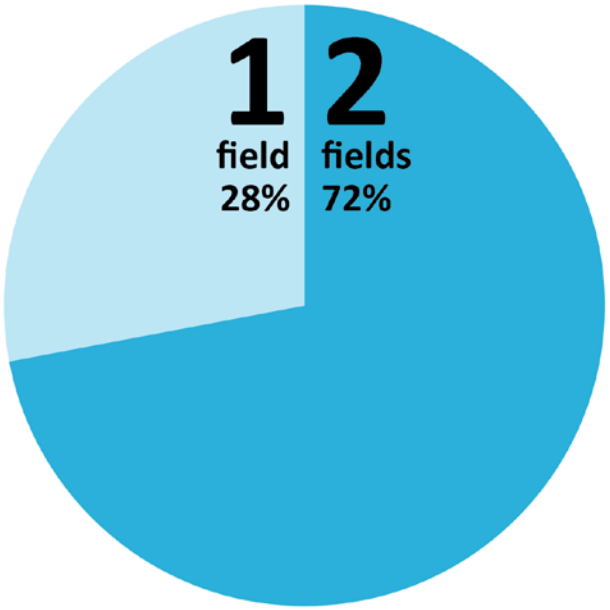
Nearby Residents



Broader Community



All Respondents*



*73% of 1288 survey respondents self-identified as sportsfield users

Kirkstone Park: ATF Conversion

Argyle Secondary School: Potential Lit Artificial Turf Field (2020)

SITE PLAN

Recommendation

THAT staff is directed to proceed with one artificial turf field plus warm-up area in Inter River Park;

AND THAT staff is directed to continue to formalize a partnership with the School District 44 to develop an artificial turf field at Argyle School;

AND THAT the program to convert gravel all-weather fields to artificial turf field surfaces, where feasible, is supported.

Comments and Questions

DISTRICT OF NORTH VANCOUVER

Thank you!

Existing DNV Sports Field Capacity Challenges

The supply of synthetic turf surfaces in North Vancouver is consistent with other Metro Vancouver municipalities

Municipality	Fields per 1000 (2008)	ATFs per 10,000 (2016)
Surrey	0.29	0.26
Delta	0.37	0.49
Coquitlam	0.39	0.42
Burnaby	0.32	0.33
North Van District *	0.37	0.30
North Van City	0.30	0.62
North Van Combined *	0.35	0.42

** Excluding Kirkstone Park, scheduled to open 2017*

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