

1 Suburban Friendship League
2 Regional Concept for Regular Season Scheduling
3 (June 29, 2021)
4

5 **EXECUTIVE SUMMARY**
6

7 The SFL Commissioners are recommending the continuation of the current geographically based
8 scheduling approach that is designed to balance several competing scheduling demands. The
9 adoption of a regional scheduling approach that focuses on travel distances has a number of
10 significant limitations that include automatically eliminating registered teams, increasing the
11 number of Sunday games, and eliminating the regular season divisions. The SFL Commissioners
12 believe that adverse impacts of these limitations would far outweigh the benefits from a
13 reduction in travel for the 30 percent of the games played by division 2 teams during the Fall
14 2019 season. While the clubs may conclude that the SFL should implement a Three Field Grid
15 Region scheduling approach, or some other rigid regional scheduling approach, the clubs will
16 also need to define the associated business rules to implement a given alternative. Attachment I
17 contains some of the key questions that will need to be answered in order the properly define the
18 business rules that will be used by a new approach.
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20 The SFL has long employed a geographically based regular season scheduling system that is
21 designed to balance several competing priorities that include (1) reducing travel time to games
22 from different clubs, (2) eliminating teams from playing each other more than once during the
23 regular season, (3) ensuring that the maximum number of games possible are played on the
24 club’s preferred game day (normally Saturday), and (4) having teams of comparable abilities play
25 each other. During the Fall 2019 season, several clubs asked the SFL revise its process of
26 registering teams and committing field slots for SFL games in order to allow the clubs to finalize
27 the number of teams that would participate at a date much closer to the date of the first week’s
28 games. The clubs were presented with the results of the SFL’s study of these issues and adopted
29 the current approach during the Spring 2020 season meeting.¹ Accordingly, no changes in these
30 areas are contemplated in this study.
31

32 Recently several clubs have requested the SFL to revise its regular season scheduling approach to
33 adopt a regional concept to reduce the travel time spent by teams going to games. No specific
34 guidelines were offered with these requests. However, the implications were clear – adopt a
35 regular season scheduling approach that places a team’s regional assignment as the primary
36 requirement used when scheduling regular season games with all other priorities being
37 subserving to the goal of reducing travel. In order to evaluate a region based scheduling

¹ The SFL study was completed on September 22, 2019. It recommended an approach that was adopted by the clubs prior to the Spring 2020 season. This paper is available on the SFL web site on the historical documents page under the SFL documents page (www.sflsoccer.org/wp-content/uploads/2020/02/regular-season-scheduling-alternatives-20190922.pdf).

1 approach the SFL considered three different regional definitions using a concept commonly
2 referred to as field grids² and then applied those definitions to the teams registered for the Fall
3 2019 season since that was the last time the SFL had its normal complement of teams, i.e., the
4 clubs and number of teams in the Fall 2019 season were fairly consistent with those participating
5 in the SFL during the prior few years. During the Fall 2019 season, the SFL consisted of 521
6 teams. The options were also evaluated against the results of the current approach which was
7 used to schedule the Fall 2019 teams. The current approach resulted in about 70 percent of the
8 division 2 games being played within three field grids. As discussed elsewhere, the travel
9 distances of the division 2 teams provides a more representative comparison to the regional
10 scheduling options considered.

11
12 This analysis found the implications on the number of teams the SFL would support varied
13 depending on other scheduling decisions that are the part of the scheduling equation. The
14 following are two critical scheduling decisions that must be made to evaluate a given regional
15 alternative.

- 16
17 • **Acceptable number of teams** – A key question would be whether the SFL should
18 schedule regions having between five and eight teams since regions of this size require all
19 of the teams to play one or more teams twice during an eight game regular season with
20 the five team divisions playing the other teams twice. Historically, clubs have stated that
21 they do not want the SFL to develop schedules where the teams play each other more than
22 once during the regular season.
- 23
24 • **Combining age groups** – The SFL has 12 distinct age groups. Combining the Under 11
25 and Under 12 age groups and the Under 13 and Under 14 age groups would result in more
26 regions having team sizes of 9 or more teams which supports scheduling teams so that
27 they do not play each other more than once during an eight game regular season. In some
28 cases, this combination would be necessary to simply make the region viable even if a
29 five team scheduling group were selected.

30
31 The following table summarizes the impact on the Fall 2019 teams of the three regional options
32 considered and the impacts of these critical decision factors.

33
² The SFL uses a field grid system to determine the potential travel distances between game
fields. Each field is assigned to a grid based on the Global Positioning System (GPS)
coordinates provided by Google Maps for that field. Each grid is about 10 miles
east to west and about 5 miles North South “as the crow flies”.

Regional Option	Individual Age Groups – 5 or More Teams	Combined Age Groups – 5 or More Teams	Individual Age Groups – 9 or More Teams	Combined Age Groups – 9 or More Teams
One Field Grid	191 / 36.7%	326 / 62.6%	31 / 6.0%	99 / 19.0%
Two Field Grids	437 / 83.9%	485 / 93.1%	216 / 41.5%	342 / 65.6%
Three Field Grids	485 / 93.1%	498 / 95.6%	430 / 82.5%	464 / 89.1%

As can be seen in the above table the impact associated with the decision on whether teams should play more than one game against a team in the same region is critical to determining whether a regional option is viable. Based on past comments received from the clubs, it does not appear that a majority of clubs would support the decision for the SFL to create schedules for groups of less than nine teams. This is especially true since the tournament could end up pairing teams that played against each other twice in the regular season for a third time in the tournament. If this is a valid assumption, then the one and two grid field region options are not considered viable approaches for scheduling SFL games. At best, they would only support 19 percent and 65.6 percent of the current teams when the age groups are combined. If the clubs decided they wanted to maintain separate age groups, then these options would only support 6 percent and 41.5 percent of the teams respectively. This does not mean that the clubs should not consider adopting such a structure for their teams, however, the SFL Commissioners believe that the SFL is not the organization that should be used to facilitate such an approach.

The Three Field Grid Region option appears more viable assuming that the clubs desire to automatically eliminate teams associated with regions that do not have a viable number of teams. For example, regions that have nine or more teams encompass about 82.5 percent of the teams using the current age group divisions and 89.1 percent of the teams using a combined age group approach. However, in addition to the automatic elimination of teams that fall within a region that does not contain a viable number of teams, the SFL Commissioners have identified some other scheduling factors that are critical to the clubs understanding the impacts of adopting this option. These include the following.

- Increasing the number of Sunday games or adopting an approach that eliminates the tournament** – Odd team scheduling groups require some teams to play two games on a weekend and a bye during another weekend. Since teams should only play one regular season game per day per VYSA, the team that needs to play two games normally plays one game on Saturday and a home game on Sunday. These are commonly referred to as Sunday games. It has been the SFL’s experience that most clubs would prefer not to have Sunday games. Accordingly, the SFL has developed an approach to minimize those where possible. Specifically, it pairs these two scheduling groups together which eliminates the need for any team to play Sunday games.

1 During the Fall 2019 season, eight (about 17 percent) of the scheduling groups, were
2 paired to avoid Sunday games. This saved the clubs and teams from having to worry
3 about 32 Sunday games. A review of the Three Field Grid Region approach showed that
4 at least 12 of the expected scheduling groups, depending on option used for determining
5 the teams for those regions, would have had an odd number of teams in scheduling
6 groups that under the SFL’s current approach would have been eliminated. This
7 translates into at least 48 additional Sunday games.³ One option to eliminate the high
8 number of Sunday games is to eliminate the tournament and use that weekend to play all
9 the “Sunday” games. Assuming that the Three Field Grid Region option that requires
10 nine teams and individual age groups is selected, placing these games on the final week
11 of the season would represent about 22 percent of the normal games played on a
12 weekend. This would also provide additional time for games that may have been
13 cancelled during the season for some reason such as field closures.

- 14
15 • **Eliminating divisions within the age groups** – During the Fall 2019 season, the SFL
16 supported divisions in all but one of the age groups expected to have divisions. The
17 establishment of divisions helps to foster the goal of having comparable teams play
18 against each other in the regular season. By its nature, the division 1 teams are spread out
19 over the area covered by the SFL and these teams travel more than their division 2
20 counterparts. Assuming that a region and a division within that region must support at
21 least nine teams, only one of the Fall 2019 division 1 age groups (Under 12 Boys
22 consisting of nine teams) would have been retained under the Three Field Grid Region
23 approach. During the Fall 2019 season, the SFL had 133 division 1 teams in the age
24 groups that had divisions. These teams represented about 25.5 percent of the total teams.
25 The benefits of breaking teams out into divisions can be seen in the season statistics. In
26 the Fall 2019 season for the age groups having two divisions, (1) many of the regular
27 season games had a goal differential of 3 goals or less and (2) the goal differential
28 percentage between the divisions was similar. Overall, about two-thirds of the games had
29 a goal score differential of three or fewer goals – 68.9 percent for the division 1 teams and
30 66.3 percent for the division 2 teams. The Fall 2019 statistics were similar to those in
31 previous seasons. The SFL Commissioners recognize that the current division approach
32 is one reason that the current scheduling approach only achieves about 70 percent of the
33 division 2 games being played within a three field grid matrix. However, the SFL
34 Commissioners believe the benefits achieved – better competition and lower score
35 differentials – outweigh the travel time increases.

³ Depending on the approach used to define the regions and teams participating, e.g., nine team minimum, combined age groups, etc., the percentage of the estimated scheduling groups would have an odd number of teams that could have been avoided using the current approach ranged from 17.4 percent to 27.9 percent.

1 **BACKGROUND**

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3 The regular season scheduling approach was reviewed in detail following the Fall 2019 season.⁴
4 As noted in this paper, the SFL’s goal in developing the regular season schedules is to have
5 teams play comparable teams in the same geographical area where possible to reduce the travel
6 time to games between clubs. However, the ability to accomplish this goal is affected by several
7 factors beyond the SFL’s control. These include the following.
8

- 9 • **Skill level of teams** – The SFL attempts to place teams associated with a given age group
10 into two divisions so that the better teams play each other. This division assignment is
11 based on the recommendation of the team’s clubs. While the SFL makes
12 recommendations on division placement, the ultimate decision is made by the clubs as
13 discussed in Section II.D. of the SFL’s Club and Coach Guide for the Spring 2021
14 Season. As noted in the guide, the goal is to have 40 to 50 percent of the teams play in
15 each division. However, during the Fall 2019 season this was not case. As shown below,
16 the clubs were only willing to place about one-third of the teams into division 1.
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Age Group	Division 1	Division 2	Total Teams	Division 1 Percentage
Under 12 Boys	12	33	45	26.7 percent
Under 12 Girls	32	0	32	No Divisions
Under 13 Boys	16	34	50	32.0 percent
Under 13 Girls	11	22	33	33.3 percent
Under 14 Boys	17	35	52	32.7 percent
Under 14 Girls	13	29	42	31.0 percent
Under 16 Boys	20	54	74	27.0 percent
Under 16 Girls	16	34	50	32.0 percent
Under 19 Boys	15	38	53	28.3 percent
Under 19 Girls	13	28	41	31.7 percent

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⁴ The Alternatives Considered for Regular Season Scheduling – Spring 2020 Season paper discusses the results of this analysis in detail and can be found on the SFL’s web site on the historical documents page (www.sflsoccer.org/historical-documents-2/). This document discusses in detail the such items as maximizing field slot utilization, reducing game conflicts for coaches with 2 teams, and ensuring that games are scheduled to eliminate “scheduling gaps”.

1 **Note:** As discussed in the SFL’s Club and Coach Guide for the Spring 2021 Season, all
2 Under 11 teams are assigned to the same division in the fall season. In addition, the
3 clubs did not identify enough division 1 teams for the Under 12 Girls to have two
4 divisions.
5

- 6 • **Sunday games** – Most clubs have expressed a desire to play SFL games on Saturday.
7 However, when a scheduling group has an odd number of teams, one or more teams must
8 play a Sunday game. Odd team scheduling groups can be caused by two situations. First,
9 the age group division has an odd number of teams. In this situation, the SFL has no
10 choice but schedule Sunday games for four regular season games. In other cases, the SFL
11 attempts to place teams in a scheduling group based on the geographical location of the
12 teams can cause an odd number of teams, e.g., the age group has 24 teams in it but 13
13 teams fit one geographical area while 11 teams fall into another geographical area.
14 Rather than have each of these groups play Sunday games, the scheduling groups are
15 “paired” so that an even number of teams are used for scheduling purposes which avoids
16 the requirement for teams to play Sunday games because of an odd team scheduling
17 group while maximizing the games a team plays in its geographical area. This topic is
18 discussed in Section X. of the SFL’s Club and Coach Guide for the Spring 2021 Season.
19 This approach eliminates eight Sunday games that would be created if a strict
20 geographical scheduling group was used.
21
- 22 • **Duplicate regular season games** – The clubs have expressed a desire that during the
23 regular season that teams do not play more than one game against another team.
24 Accordingly, during an eight game regular season, a scheduling group (or combination of
25 scheduling groups) must contain at least nine teams. Much like the approach taken with
26 odd team scheduling groups to reduce the number of Sunday games, when a scheduling
27 group is created for geographical reasons but contains less than nine teams, it is normally
28 “paired” with another scheduling group so that no team plays another team twice during
29 the regular season. This approach maximizes the games a team plays in its geographical
30 area while accomplishing the goal of having no team play another team twice during the
31 regular season.
32

33 The current scheduling approach was designed to balance these contradictory requirements or
34 trade offs in scheduling games, i.e., the SFL attempts to balance the competing requirements
35 when developing a given schedule rather than simply focusing on the travel distances to games.
36 This approach was taken since by its very nature, the SFL has clubs and teams over a wide
37 geographical area, i.e., a large number of teams are not present in a very small area that would
38 allow the satisfaction of many of the above requirements without compromise.
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1 **Approach Used to Determine**
2 **Geographic Scheduling Groups**

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4 The SFL covers a wide geographic area and needed a standardized means to identify the potential
5 travel distance a team may travel in order to facilitate the goal of grouping teams into geographic
6 areas for scheduling purposes. The approach adopted was to (1) define the potential area that
7 would be needed to encompass the fields used by the SFL clubs, (2) break that area down into
8 100 standard field grids, and (3) assign each field to a field grid. The SFL uses the GPS
9 coordinates provided by Google Maps based on the field addresses to accomplish this task. A
10 field grid using the Google Maps GPS coordinates, is about 10 miles east to west and about 5
11 miles North South “as the crow flies”.

12
13 The field grid system allows the SFL to evaluate the success of scheduling teams to play teams in
14 the same geographic areas by measuring the number of field grids a team must travel to play its
15 games. The optimum is for teams from different clubs to play their games in the same field grid.
16 However, this is unrealistic since, although some field grids have teams from two or more clubs
17 associated with them, these teams are insufficient for viable scheduling groups because the
18 number of teams associated with a given age group and division is very small. When developing
19 a scheduling group, the SFL attempts to group teams so that they do not have to travel more than
20 three field grids with two field grids considered optimal. Since teams from two different clubs
21 can be associated with same field grid, the team’s home field is assigned as the first field grid for
22 the number of field grids a team must travel. The following illustrates how a two field grid
23 matrix would look.

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Field Grid 14	Field Grid 15
Field Grid 24	Field Grid 25

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28 As can be seen above, a team would have to travel no more than two field grids to go to another
29 field, i.e., the field grid of its game field and the field grid assigned to the opposing team’s game
30 field. For example, assume that a team’s home field was in Field Grid 14 above. Only teams in
31 field grids 15, 24, and 25 would be considered in the same field grid matrix since those teams
32 would have to travel more than two field grids to play teams in the other field grids that may
33 border Field Grid 14.

34
35 A three field grid matrix consists of nine field grids as shown below.

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Field Grid 4	Field Grid 5	Field Grid 6
Field Grid 14	Field Grid 15	Field Grid 16
Field Grid 24	Field Grid 25	Field Grid 26

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As can be seen above, no team would have to travel more than three field grids to go to another field using the same logic used for the two field grid matrix, e.g., although a team in Field Grid 3 would be within three field grids of a team in Field Grid 4, teams in Field Grids 6, 16, and 26 would need to travel four field grids to play the same team in Field Grid 3.

Assigning fields to field grids makes it easier to understand relative field placement. However, it is difficult to understand the actual travel distances involved between fields. Although the number of field grids has a relationship to the distance a team has to travel, the more field grids traversed does not necessarily mean a longer distance traveled. The following highlight some of these differences.

- A team traveling two field grids may only go 2.4 miles while team traveling within the same field grid may have to travel 8.6 miles.
- A team traveling four field grids may go 19.2 miles while team traveling three field grids may travel 24.3 miles.

These examples were taken from the following table that provides additional examples of the travel distances associated with various field grid combinations.

Number of Field Grids	Field 1	Field 2	Lowest Miles
2	Chantilly High School – Chantilly (Field Grid 55)	Arrowhead Park – Herndon (Field Grid 56)	2.4 miles
2	Westfield High School – Chantilly (Field Grid 55)	EC Lawrence – Southwestern (Field Grid 56)	2.8 miles
1	Hutchinson Park– Herndon (Field Grid 54)	Ray Muth Park – Loudoun (Field Grid 54)	8.6 miles
2	Ossian Hall Turf – Annandale (Field Grid 76)	Manchester Lakes – Lee-Mt. Vernon (Field Grid 77)	9.4 miles
2	Hellwig Park – Northern Virginia (Field Grid 58)	Tyrell Park – Prince William (Field Grid 68)	14.4 miles
4	Athey – Fauquier/ Warrenton (Field Grid 17)	Patriot High School – Haymarket (Field Grid 47)	16.5 miles
3	Chantilly High School – Chantilly (Field Grid 55)	Langley High School – McLean (Field Grid 75)	18.8 miles
4	Athey – Fauquier/ Warrenton (Field Grid 17)	Valley View – Northern Virginia (Field Grid 47)	19.2 miles

	Number of Field Grids	Field 1	Field 2	Lowest Miles
1	3	Valley View Park – Northern Virginia (Field Grid 47)	Tyrell Park – Prince William (Field Grid 68)	21.4 miles
2	3	Langley High School – McLean (Field Grid 75)	South County High School – Springfield (Field Grid 77)	23.3 miles
3	4	Phil Bolen Park – Loudoun (Field Grid 43)	Spring Hill Rec. – McLean (Field Grid 75)	24.8 miles
4	5	Athey – Fauquier/ Warrenton (Field Grid 17)	EC Lawrence – Southwestern (Field Grid 56)	27 miles
5	4	Phil Bolen Park – Loudoun (Field Grid 43)	Langley High School – McLean (Field Grid 75)	28.8 miles
6	5	Athey – Fauquier/ Warrenton (Field Grid 17)	Chantilly High School – Chantilly (Field Grid 55)	29.3 miles
7	4	Ida Lee Park – Loudoun (Field Grid 43)	Langley High School – McLean (Field Grid 75)	30.7 miles

Note: Google Maps was used to determine the travel distances. When Google Maps provided more than one route between fields, the route with the lowest number of miles was used.

As can be seen in this table, although there is a relationship between the number of field grids a team must travel to the distance the team must travel, the greater the number of field grids does not necessarily translate into a greater travel distance than that incurred if the team traveled fewer field grids.

**REGIONAL SCHEDULE GROUPING
ALTERNATIVES CONSIDERED**

Several clubs requested the SFL to consider going to a region based scheduling system to reduce travel time and effort for the clubs. It is important to remember that adoption of a region based scheduling approach implies that a team’s region assignment is the key factor that should be used to determine how games should be scheduled and that other requirements, e.g., reducing Sunday games, having teams play teams of comparable abilities, only playing a team once during the regular season, etc., are subservient to the goal of only having teams play games within a

1 preestablished region. The SFL Commissioners developed three regional options and reviewed
2 the data associated with the Fall 2019 season⁵ to evaluate each option.

3 4 **Potential Regional Options**

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6 The following potential regional options were considered.

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8 • **Single Field Grid Region** – Under this option only teams playing in a given field grid
9 would be scheduled against each other. This would ensure that teams do not have to
10 travel more than one field grid to play their games. Based on the anecdotal examples
11 used elsewhere, the travel distance between fields within the field grid should be less than
12 10 miles.
- 13
14 • **Two Field Grid Region** – Under this option teams would be assigned to a two field grid
15 matrix and only play teams within that field grid matrix. This would ensure that teams do
16 not have to travel more than two field grids to play their games. Based on the anecdotal
17 examples used elsewhere, the travel distance between fields within a two field grid should
18 be less than 20 miles.
- 19
20 • **Three Field Grid Region** – Under this option teams would be assigned to a three field
21 grid matrix and only play teams within that field grid matrix. This would ensure that
22 teams do not have to travel more than three field grids to play their games. The current
23 scheduling approach attempts to limit travel to three field grids. Based on the anecdotal
24 examples used elsewhere, the travel distance between fields within a three field grid
25 matrix should be less than 30 miles for most teams. The three field grid option is
26 compatible with the goal of the current scheduling approach which considers teams
27 playing within three field grids of each other to be geographically located.

28 29 **Criteria Used to Evaluate Regional Alternatives**

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31 Adopting a regional scheduling approach implies that a team's region assignment is the key
32 factor that should be used to determine how games should be scheduled. Accordingly, other
33 requirements are subservient to the goal of only having teams play games with a preestablished
34 region. The following criteria were used to evaluate a given alternative.

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36 • At least five teams from an age group would need to be associated within a given region
37 to be considered viable. A five team scheduling group results in each team playing the
38 other teams in the scheduling group twice during an eight game regular season.

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⁵ The Fall 2019 season was the last season where the SFL had its normal club and team participation based on club and team registrations over the past few years.

- Age groups without the required number of teams in a given region would consolidate their teams into less defined age groups to determine whether a sufficient number of teams exist to support a given region. Specifically, the Under 11 and Under 12 teams would be combined and considered as Under 12s and the Under 13 and Under 14 teams would be combined and considered as Under 14 teams.

As discussed in Attachment II, several different approaches can be used to assign field grids to a region. The methodology adopted for the two and three field grid regions is commonly referred to as the Flexible Age Group Field Grid approach. This methodology optimizes the region definitions to teams present in the various field grids while supporting changes that may occur in those field grids. Specifically, the regional definitions were designed to maximize the number of teams assigned to a given region from the Under 11 and Under 12 age groups, Under 13 and Under 14 age groups, and Under 16 and Under 19 age groups, i.e., the field grids used to define a given region for Under 11 and Under 12 teams may be different than those used to define a similar region for the Under 13 and Under 14 teams which may differ from those used for the Under 16 and Under 19 age groups. These three region definitions were used since (1) the Under 11 and 12 age groups and the Under 13 and Under 14 age groups may need to be combined as discussed elsewhere to create a viable region and (2) clubs that have Under 16 teams also normally have Under 19 teams.

Evaluation of Regional Alternatives

The number of Fall 2019 teams in each of the three broad age groups associated with each field grid were identified and used to define the regions that would best serve a given group of teams. In the case of the Single Field Grid Region, these teams represented the teams available for that region. In the case of the two and three field grid regions, these teams were used to define the logical regions for each of the broad age groups as discussed elsewhere. Once the regions were determined, two broad analyses were performed. The first determined the number of teams applicable to a given region while the next one determined the number of teams applicable to a given region if the Under 11s and 12s were combined and if the Under 13s and Under 14s were combined. Within each of these, an analysis was made to determine whether the number of teams would support game schedules that either (1) required the teams to play one or more games against the same team in the regular season or (2) supported a game schedule where a team would only play another team once during the regular season. The below table summarizes these analyses. Attachment III shows the Two Field Grid Regions for each of the three broad age groups and the number of teams in those age groups for each region. Attachment IV shows similar information for the Three Field Grid Region approach.

1 **Number of Fall 2019 Teams Using One, Two, and Three Field Grid Regions – Existing Age Groups**

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Age Group	Fall 2019 Teams	Single Grid Region – 5 to 8 Teams	Single Grid Region – 9 or More Teams	Two Grid Region – 5 to 8 Teams	Two Grid Region – 9 or More Teams	Three Grid Region – 5 to 8 Teams	Three Grid Region – 9 or More Teams
Under 11 Boys	30	10 / 33.3%	0 / 0.0%	15 / 50.0%	11 / 36.7%	0 / 0.0%	29 / 96.7%
Under 11 Girls	19	0 / 0.0%	0 / 0.0%	7 / 36.8%	0 / 0.0%	6 / 31.6%	11 / 57.9%
Under 12 Boys	45	32 / 71.1%	0 / 0.0%	5 / 11.1%	37 / 82.2%	0 / 0.0%	42 / 93.3%
Under 12 Girls	32	8 / 25.0%	0 / 0.0%	12 / 37.5%	12 / 37.5%	0 / 0.0%	28 / 87.5%
Under 13 Boys	50	17 / 34.0%	11 / 22.0%	25 / 50.0%	23 / 46.0%	8 / 16.0%	40 / 80.0%
Under 13 Girls	33	0 / 0.0%	0 / 0.0%	22 / 66.7%	0 / 0.0%	5 / 15.2%	22 / 66.7%
Under 14 Boys	52	10 / 19.2%	11 / 21.2%	16 / 30.8%	24 / 46.2%	0 / 0.0%	48 / 92.3%
Under 14 Girls	42	11 / 26.2%	0 / 0.0%	20 / 47.6%	13 / 31.0%	12 / 28.6%	28 / 66.7%
Under 16 Boys	74	27 / 36.5%	9 / 12.2%	22 / 29.7%	49 / 66.2%	5 / 6.8%	66 / 89.2%
Under 16 Girls	50	22 / 44.0%	0 / 0.0%	25 / 50.0%	18 / 36.0%	0 / 0.0%	46 / 92.0%
Under 19 Boys	53	11 / 20.8%	0 / 0.0%	28 / 52.8%	20 / 37.7%	14 / 26.4%	38 / 71.7%
Under 19 Girls	41	12 / 29.3%	0 / 0.0%	24 / 58.5%	9 / 22.0%	5 / 12.2%	32 / 78.0%
Total	521	160 / 30.7%	31 / 6.0%	221 / 42.4%	216 / 41.5%	55 / 10.6%	430 / 82.5%

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20 **Number of Fall 2019 Teams Using One, Two, and Three Field Grid Regions – Combining U11/12 and U13/14 Age Groups**

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Age Group	Fall 2019 Teams	Single Grid Region – 5 to 8 Teams	Single Grid Region – 9 or More Teams	Two Grid Region – 5 to 8 Teams	Two Grid Region – 9 or More Teams	Three Grid Region – 5 to 8 Teams	Three Grid Region – 9 or More Teams
Under 11/12 Boys	75	32 / 42.7%	39 / 52.0%	8 / 10.7%	63 / 84.0%	0 / 0.0%	71 / 94.7%
Under 11/12 Girls	51	38 / 74.5%	0 / 0.0%	13 / 25.5%	37 / 72.5%	5 / 9.8%	45 / 88.2%
Under 13/14 Boys	102	43 / 42.2%	42 / 41.2%	10 / 9.8%	91 / 89.2%	5 / 4.9%	96 / 94.1%
Under 13/14 Girls	75	42 / 56.0%	9 / 12.0%	13 / 17.3%	55 / 73.3%	0 / 0.0%	70 / 93.3%
Under 16 Boys	74	27 / 36.5%	9 / 12.2%	22 / 29.7%	49 / 66.2%	5 / 6.8%	66 / 89.2%
Under 16 Girls	50	22 / 44.0%	0 / 0.0%	25 / 50.0%	18 / 36.0%	0 / 0.0%	46 / 92.0%
Under 19 Boys	53	11 / 20.8%	0 / 0.0%	28 / 52.8%	20 / 37.7%	14 / 26.4%	38 / 71.7%
Under 19 Girls	41	12 / 29.3%	0 / 0.0%	24 / 58.5%	9 / 22.0%	5 / 12.2%	32 / 78.0%
Total	521	221 / 42.4%	175 / 33.6%	142 / 27.3%	342 / 65.6%	34 / 6.5%	464 / 89.1%

1 **Key Observations – Single Field Grid Option**
2

3 The Single Field Grid Region approach has the advantage of greatly reduced travel distances between
4 fields. However, it has several significant disadvantages that include the following.

- 5
- 6 • The number of teams the SFL could support would be greatly reduced to 191 teams or about 37
7 percent of the 521 teams serviced during the Fall 2019 season using the existing age groups.
8 Even combining the Under 11 and Under 12 and the Under 13 and 14 age groups would only
9 result in a total of 326 or less than about 62.6 percent of the Fall 2019 season teams being
10 supported.
- 11
- 12 • Almost all the field grids would be playing at least more than one game against the same team
13 during the regular season. Only 31 teams would be assigned to regions where 9 or more teams
14 were present and combining the Under 11 and Under 12 and the Under 13 and Under 14 age
15 groups would only improve this to 99 teams or about 19 percent of the Fall 2019 teams.
- 16

17 Because of the significant reduction in teams serviced and the high number of games where teams would
18 be playing the same team more than once during the regular season. The single field grid option was not
19 considered viable for the SFL.

20

21 **Key Observations – Two Field Grid Region Option**
22

23 The Two Field Grid Region approach has the advantage of reduced travel distances between fields.
24 However, it has several significant disadvantages that include the following.

- 25
- 26 • The number of teams the SFL could support would be reduced to 437 – about 84 percent of the
27 521 teams serviced during the Fall 2019 season using the existing age groups. Combining the
28 Under 11 and Under 12 and the Under 13 and 14 age groups would increase this slightly to 485
29 teams or about 93 percent of the Fall 2019 season teams being supported.
- 30
- 31 • About 221 teams would be playing more than one game against the same team during the regular
32 season and while 216 teams would have the traditional SFL schedule where a team only played
33 another team once during the regular season. Combining the Under 11 and Under 12 age groups
34 and the Under 13 and Under 14 age groups would improve this. The number of teams that
35 would have to play another team more than once during the regular season would fall to about
36 143 teams and the number of teams playing a traditional SFL schedule would increase to 342
37 teams.
- 38

39 Although the Two Field Grid Region approach is a significant improvement over the Single Field Grid
40 Region approach, it is not considered a viable option for the SFL since (1) about 16 percent of the Fall
41 2019 season teams would be eliminated, (2) even combining age groups only about 93 percent of the
42 Fall 2019 teams would be serviced, and (3) a large number of teams (143 or about 27.4 percent) would
43 still end up playing another team twice during the regular season even if the Under 11 and Under 12 and
44 Under 13 and Under 14 age groups were combined. Another way of looking at this option is that only
45 about 41.5 percent of the Fall 2019 teams would be playing games that do not require the teams to play

1 at least one other team twice during the regular season using the traditional age groups. This percentage
2 would improve to about 66 percent if the age groups were combined.

4 **Key Observations – Three Field Grid Region Option**

6 The Three Field Grid Region approach closely resembles the current approach of attempting to have
7 teams travel no more than three field grids. The key benefit of this approach is that 100 percent of the
8 teams assigned to a given region will play no more than three field grids from their home field while
9 under the current approach this goal is accomplished 70 percent of the time for the division 2 teams.
10 Achieving this improvement results in the elimination of teams from the SFL.⁶ The number of teams
11 being eliminated depends on the approach used to define age groups and whether teams should be
12 scheduled to play more than once against each other during the regular season when a region has less
13 than nine teams as shown below.

- 15 • **Combining age groups** – About 23 teams would be eliminated if the Under 11 and Under 12
16 age groups and Under 13 and Under 14 age groups are combined. This number increases to 36
17 teams if the current age groups are retained. This also assumes that the clubs would support the
18 regional teams playing another team more than once during the regular season in regions where
19 fewer than nine teams are present. These represented about 6.5 percent and 10.6 percent
20 respectively of the Fall 2019 teams.
- 22 • **Playing duplicate regular season games** – If the clubs only want to support age groups in
23 regions that contain nine or more teams, then the number of teams dropped increases to 57 teams
24 if the age groups are combined and 91 if the existing age groups are retained. These represent
25 about 11 percent and 17 percent respectively of the Fall 2019 teams.

27 Although this option would ensure that teams remaining in the SFL would not have to travel more than
28 three field grids, the focus solely on travel distances negates several other advantages that the current
29 approach offers as discussed elsewhere. Accordingly, the SFL Commissioners recommend against
30 adopting this approach. However, if the clubs desire this approach then they will also need to decide the
31 business rules that should be applied by the SFL. Attachment I contains some the key business rules that
32 would have to be defined by the clubs if the Three Field Grid Region approach is adopted.

34 **COMPARISON OF THE CURRENT** 35 **SCHEDULING APPROACH TO A** 36 **REGIONAL APPROACH**

38 The primary difference between the current scheduling approach and a regional scheduling approach is
39 that the current approach attempts to balance a number of competing scheduling requirements rather than
40 focus on a team's regional assignment. As discussed elsewhere, the SFL Commissioners did not believe

⁶ The number of teams being eliminated would total 36 teams from seven different clubs for the traditional age groups supported by the SFL and 23 teams from five different clubs for the combined age groups. The actual club names associated with a given age group are not being disclosed to reduce potential bias in evaluating the proposal.

1 that any of the three regional scheduling alternatives reviewed should be adopted since focusing on
2 travel as the sole criteria for scheduling eliminated several benefits associated with the current approach.

3
4 In order to better measure the benefits of the current approach to a regional scheduling approach, the
5 SFL Commissioners reviewed an analysis of the effectiveness of the current approach in achieving its
6 goal of having teams play their games within a three field grid matrix and then reviewed the factors used
7 by the current approach to balance competing schedule requirements to the Three Field Grid Region
8 approach. The SFL Commissioners concluded that the advantages for the current approach outweigh the
9 advantages of adopting a regional approach where a team's region assignment is the key factor that
10 should be used to determine how games should be scheduled and that other requirements are subservient
11 to the goal of only having teams play games within a preestablished region, i.e., although the current
12 approach does not accomplish its geographic scheduling goal, its ability to satisfy the competing
13 scheduling requirements offset the results that 30 percent of the Fall 2019 division 2 teams had to travel
14 more than three field grids to play their regular season games. The factors in this analysis included the
15 following.

- 16 • Effectiveness in reducing travel times.
- 17 • Division structure
- 18 • Preventing duplicate regular season games
- 19 • Reducing the number of Sunday games
- 20 • Reducing the SFL's coverage area

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26
27 The SFL Commissioners believe that the benefits of the second, third, and fourth items more than offset
28 the disadvantage of the current approach's ability to achieve a 70 percent effectiveness rate of having the
29 division 2 teams play their games in a three field grid area. The primary purpose of this discussion is to
30 simply provide the data that can be used by the clubs to make an informed decision rather than depend
31 on subjective opinions and assumptions. Whether the SFL should reduce its coverage area, eliminate
32 divisions, or take other actions to reduce the number of games where teams travel more than three field
33 grids that is being experienced using the current approach while overcoming some of the limitations
34 associated with a regional approach is a matter that must be decided by the clubs and the SFL
35 Commissioners are not expressing an opinion on any specific option. However, analysis of the effects
36 reducing the SFL's coverage area by eliminating the teams that would have been eliminated under the
37 Three Field Grid Region approach showed that team location was not the primary reason for the number
38 of games involving travel distances that exceeded three field grids. The analysis of each of these topics
39 is discussed below.

40 41 **Effectiveness of Current Approach In** 42 **Reducing Travel Times**

43
44 In order to evaluate how effective the SFL's current scheduling approach places teams in geographical
45 proximity to each other, an analysis was conducted to determine the number of regular season games
46 during the Fall 2019 season that were played in the same field grid, two field grid matrixes, three field

1 grid matrixes, and games where the teams had to travel more than 3 field grids. As shown in the table
 2 below, almost all of the age groups played two-thirds of their games within a three field grid matrix and
 3 over 50 percent of the games played within a two field grid matrix. This is well below the goal of
 4 having most games played within a three field grid matrix or adopting the Three Field Grid Region
 5 scheduling approach discussed elsewhere.

6
7 **Regular Season Games – Fall 2019**
8

Age Group	Total Games	One to Three Grids	Percent	Four or More Grids	Percent
Under 11 Boys	120	97	80.8%	23	19.2%
Under 11 Girls	76	45	59.2%	31	40.8%
Under 12 Boys	48 / 132	35 / 85	72.9% / 64.4%	13 / 47	27.1% / 35.6%
Under 12 Girls	128	88	68.8%	40	31.3%
Under 13 Boys	64 / 132	33 / 87	51.6% / 65.9%	31 / 45	48.4% / 34.1%
Under 13 Girls	44 / 88	16 / 48	36.4% / 54.5%	28 / 40	63.6% / 45.5%
Under 14 Boys	68 / 140	36 / 96	52.9% / 68.6%	32 / 44	47.1% / 31.4%
Under 14 Girls	52 / 116	33 / 81	63.5% / 69.8%	19 / 35	36.5% / 30.2%
Under 16 Boys	80 / 216	29 / 159	36.3% / 73.6%	51 / 57	63.8% / 26.4%
Under 16 Girls	64 / 136	35 / 102	54.7% / 75.0%	29 / 34	45.3% / 25.0%
Under 19 Boys	54 / 152	33 / 115	61.1% / 75.7%	21 / 37	38.9% / 24.3%
Under 19 Girls	52 / 112	21 / 81	40.4% / 72.3%	31 / 31	59.6% / 27.7%
Total	850 / 1,224	501 / 854	58.9% / 69.8%	349 / 370	41.1% / 30.2%

24
25 **Note:** When an age group has two divisions, each division is broken out separately with the division 1
26 teams shown first.

27
28 A review of the tournament games showed that the travel distance also exceeded the three field grid goal
29 and was very close to the travel experience of the division 1 regular season teams in the age groups that
30 had two divisions. This is not surprising since the goal of the tournament, much like the division 1
31 teams, is to pair teams with similar abilities together. The following shows the travel distances for the
32 Fall 2019 tournament games.
33

Tournament Games – Fall 2019

Age Group	Total Games	One to Three Grids	Percent	Four or More Grids	Percent
Under 11 Boys	24	20	83.3%	4	16.7%
Under 11 Girls	15	8	53.3%	7	46.7%
Under 12 Boys	35	22	62.9%	13	37.1%
Under 12 Girls	24	12	50.0%	12	50.0%
Under 13 Boys	36	23	63.9%	13	36.1%
Under 13 Girls	26	13	50.0%	13	50.0%
Under 14 Boys	38	18	47.4%	20	52.6%
Under 14 Girls	32	18	56.3%	14	43.8%
Under 16 Boys	53	25	47.2%	28	52.8%
Under 16 Girls	36	18	50.0%	18	50.0%
Under 19 Boys	37	18	48.6%	19	51.4%
Under 19 Girls	33	23	69.7%	10	30.3%
Total	389	218	56.0%	171	44.0%

Division Structure

One SFL scheduling goal that competes with a regional scheduling approach is to schedule teams of comparable abilities to play each other during the regular season. This goal is designed to improve the competition between teams and reduce the number of games with excessive score differentials. The approach used to accomplish this goal by the SFL is to request the clubs to place their better teams into a separate division. These are considered division 1 teams with the club’s remaining teams placed in division 2. Each season the SFL distributes to its clubs a summary of the goal score differential for the regular season and tournament games broken out by age group. As shown below, for the age groups having two divisions, (1) many of the regular season games had a goal differential of three goals or less and (2) the goal differential percentage between the divisions was similar. Overall, about two-thirds of the games had a goal score differential of three or fewer goals.

Age Group	Division 1 Games	Games with Goal Differential of 3 Goals or Less	Division 2 Games	Games with Goal Differential of 3 Goals or Less
Under 12 Boys	48	26 / 54.2%	129	81 / 62.8%
Under 13 Boys	64	32 / 50.0%	127	84 / 66.1%
Under 13 Girls	44	40 / 90.9%	87	60 / 69.0%
Under 14 Boys	66	43 / 65.2%	135	90 / 66.7%
Under 14 Girls	51	41 / 80.4%	113	78 / 69.0%
Under 16 Boys	76	48 / 63.2%	210	121 / 57.6%
Under 16 Girls	63	51 / 81%	129	88 / 68.2%
Under 19 Boys	49	33 / 67.3%	147	106 / 72.1%
Under 19 Girls	50	38 / 76.0%	107	71 / 66.4%
Total	511	352 / 68.9%	1,497	993 / 66.3%

A review of the Fall 2019 SFL teams showed that the division 1 teams would have been spread out among the various regions as defined in the Three Field Grid Region option discussed elsewhere and only about 36 percent or 48 of the 133 Fall 2019 division 1 teams could be placed in a separate division, assuming (1) the region had enough division 2 teams to form two divisions and (2) the division size was five teams or more. If the division size needed to be nine teams or more in order to keep teams from playing the same game twice, then less than seven percent of the division 1 teams could have remained in division 1 as shown in the table below.

Age Group	Fall 2019 Division 1 Teams	Teams in 3 Field Grid Regions with 5 or More Division 1 Teams	Percent of Fall 2019 Division 1 Teams	Teams in 3 Field Grid Regions with 9 or More Division 1 Teams	Percent of Fall 2019 Division 1 Teams
Under 12 Boys	12	9	75.0%	9	75.0%
Under 13 Boys	16	5	31.3%	0	0.0%
Under 13 Girls	11	0	0.0%	0	0.0%
Under 14 Boys	17	7	41.2%	0	0.0%
Under 14 Girls	13	7	53.8%	0	0.0%
Under 16 Boys	20	8	40.0%	0	0.0%
Under 16 Girls	16	6	37.5%	0	0.0%
Under 19 Boys	15	6	40.0%	0	0.0%
Under 19 Girls	13	0	0.0%	0	0.0%
Total	133	48	36.1%	9	6.8%

Note: In the fall seasons no attempt is made to separate the Under 11s into division since this is the first season that they play in the SFL and the clubs believe it is impracticable to reliably identify the better teams. The clubs did not identify enough division 1 teams for the Under 12 Girls so it only had one division.

As shown above, adopting a regional approach does not support the traditional divisional structure the SFL strives to achieve. In addition, one of the potential Under 13 Boys regions which had enough teams to form a division 1 group, did not have enough teams to support a division 2 group. Accordingly, this region would need to combine the two divisions. Furthermore, the splitting the region into divisions would cause 9 of the 14 possible regions that could support divisions have less than 9 teams in a division which means that the teams would need to play at least one other team twice during the regular season. On the other hand, none of the teams in these seven regions would have to play each other more than once in the regular season if they did not use divisions.

It is recognized that the SFL tournament is designed to have teams of comparable abilities play each other and some may believe that this eliminates the need for divisions. It is unclear how an analysis could be performed to validate this belief. However, the SFL tournament assigns teams to the tournament divisions based on their regular season division, i.e., the division 1 regular season teams normally play each other in the tournament. The Fall 2019 tournament statistics showed that about 74 percent of the games had a score differential of two goals or less which was significantly higher than the almost 51 percent experienced during the regular season. While this shows that the SFL tournament

1 approach appears to pair teams of comparable abilities for the tournament, it is unclear the same balance
2 would have occurred if the divisions had been eliminated.

3
4 The SFL Commissioners recognize that the current division approach is one reason that the current
5 scheduling approach only achieves about two-thirds of the games within the three field grid matrix goal.
6 However, the SFL Commissioners believe the benefits achieved – better competition and lower score
7 differentials – outweigh the travel time increases.

8 9 **Duplicate Regular Season Games**

10
11 The SFL breaks down an age group and division into scheduling groups based on the number of teams
12 that are geographically located together. The SFL also has adopted a scheduling requirement that
13 mandates that no team should play another team twice during the regular season. Accordingly, each
14 scheduling group must contain at least nine teams. In some cases, the logical geographic based grouping
15 of teams results in less than nine teams. In these cases the SFL combines the scheduling group with
16 another scheduling group that consists of teams of the same age group and division to (1) maximize the
17 number of games each scheduling group plays against teams in its geographical area and (2) ensuring
18 that no team plays another team twice during the regular season. This approach is normally preferable to
19 putting all the teams in the same scheduling group for a variety of reasons. Unfortunately, the adverse
20 side effect is that one or more teams in the two groups will probably have to travel more than three field
21 grids. During the Fall 2019 season, 47 scheduling groups were used to schedule the 521 teams. Of
22 these, eight or about 17 percent were paired to ensure that teams would not play duplicate games during
23 the regular season. In many cases, these really only resulted in one or at most two games outside of the
24 scheduling group or the planned geographical region for those teams that were paired. The SFL
25 Commissioners believe that this is an acceptable trade off to the regional approach. As noted elsewhere,
26 55 or 10.6 percent of the 485 Fall 2019 teams that would be scheduled under the Three Field Grid
27 Region approach would play one or more regular season games against the same team twice using the
28 Fall 2019 age groups. Even if the age groups were combined, which would allow more teams to be
29 scheduled, 34 or 6.5 percent of the 498 teams would still play duplicate regular season games.

30 31 **Sunday Games**

32
33 Odd team scheduling groups require some teams to play two games on a weekend and a bye during
34 another weekend. Since teams should only play one regular season game per day per VYSA, the team
35 that needs to play two games normally plays one game on Saturday and a home game on Sunday. These
36 are commonly referred to as Sunday games. Most clubs would prefer not to have Sunday games so the
37 SFL has developed an approach to minimize those where possible. During the Fall 2019 season eight of
38 the scheduling groups had an odd number of teams in them since the teams in a given scheduling group
39 made the best sense from a geographical perspective to have an odd number of teams. For example,
40 assume that one scheduling group had teams from four clubs with a total of 11 teams and another
41 scheduling group had 11 teams representing 5 clubs. The SFL has three options for scheduling these two
42 groups. One option is to have each scheduling group play four Sunday games or eight Sunday games
43 total. Another option is to schedule these two scheduling groups to play eight games against each other.
44 This way none of the teams need to play a Sunday game. The other option – move a team from its
45 geographical area to the other scheduling group's geographical area – is not considered desirable at all.
46 During the Fall 2019 season, eight or about 17 percent of the scheduling groups were paired to avoid

1 Sunday games. This saved the clubs and teams from having to worry about 32 Sunday games. A review
 2 of the Three Field Grid Region approach showed that 12 of the scheduling groups would have had an
 3 odd number of teams that would have dictated 48 Sunday games that under the SFL’s current approach
 4 could have been avoided by using the pairing process discussed earlier.

5
 6 As with the process to eliminate duplicate regular season games discussed elsewhere, this approach can
 7 lead to teams having to travel more than three field grids. The SFL Commissioners believe that this is
 8 an acceptable trade off to a regional approach.

9
 10 **Travel Distances**

11
 12 As noted elsewhere, the current scheduling approach attempts to balance several competing priorities
 13 and these competing priorities are the reason that about 30 percent of the division 2 teams have to travel
 14 more than the desired three field grids. It is difficult to quantitatively understand how much a given
 15 factor may contribute to the amount of travel exceeding the three field grid goal. However, one possible
 16 reason that may be cited is the SFL allowing teams in outlying areas to participate which means that
 17 teams have to travel excessive distances to support those games. This thesis can be tested by (1)
 18 determining the teams that would be eliminated if the SFL adopted a Three Field Grid Region concept
 19 and (2) determining the number of Fall 2019 regular season games involving these teams that resulted in
 20 teams traveling more than three field grids to play games. The below table shows a comparison by age
 21 group and division of the number of Fall 2019 regular season games that (1) actually resulted in teams
 22 having to travel more than three field grids and (2) the number of games that would have resulted if the
 23 games associated with the teams that would be eliminated under the Three Field Grid Region approach
 24 were not played.

Age Group	Fall 2019 Actual Games		Fall 2019 Games With Three Field Grid Region Teams Eliminated	
	Total Games – 4 or More Field Grids	Percent	Total Games – 4 or More Field Grids	Percent
Under 11 Boys	23	19.2%	15	13.3%
Under 11 Girls	31	40.8%	16	25.8%
Under 12 Boys	13 / 47	27.1% / 35.6%	13 / 26	26.5% / 23.2%
Under 12 Girls	40	31.3%	20	19.4%
Under 13 Boys	31 / 45	48.4% / 34.1%	31 / 31	47.7% / 26.1%
Under 13 Girls	28 / 40	63.6% / 45.5%	15 / 22	50.0% / 34.9%
Under 14 Boys	32 / 44	47.1% / 31.4%	32 / 19	46.4% / 16.8%
Under 14 Girls	19 / 35	36.5% / 30.2%	19 / 22	35.8% / 21.4%
Under 16 Boys	51 / 57	63.8% / 26.4%	35 / 49	53.8% / 23.3%
Under 16 Girls	29 / 34	45.3% / 25.0%	16 / 30	32.0% / 24.4%
Under 19 Boys	21 / 37	38.9% / 24.3%	21 / 30	38.2% / 20.5%
Under 19 Girls	31 / 31	59.6% / 27.7%	31 / 15	58.5% / 17.6%
Total	349 / 370	41.1% / 30.2%	264 / 244	34.4% / 22.7%

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 44 As shown above, overall eliminating the teams that would be eliminated under the Three Field Grid
 45 Region approach would only reduce the percentage of games where division 2 teams had to travel more
 46 than three field grids from about 30 percent to about 23 percent. Accordingly, other factors, such as

1 eliminating teams from playing each other more than twice during the regular season and reducing the
2 number of Sunday games appear to have a far greater impact on the reason that teams need to travel
3 more than the desired three field grids to play regular season games.
4
5
6

1 **Key Decisions Needed When Implementing**
2 **A Regional Scheduling Approach**
3
4

5 As noted elsewhere, the SFL Commissioners are recommending the continuation of current scheduling
6 approach that attempts to balance competing scheduling requirements. However, the clubs may elect to
7 adopt a regional scheduling approach that places a team's regional assignment as the primary
8 requirement used when scheduling regular season games with all other priorities being subservient to the
9 goal of reducing travel. Adoption of a region based system is key decision. However, it is only the first
10 step. More importantly, the business rules that are adopted to support that decision must be clearly
11 defined. Key business rule decisions that must be made regardless of the regional scheduling approach
12 adopted include the following.

- 13
- 14 • When should the region definitions be defined, i.e., when the initial team registrations are due
15 (March 1/August 1) or the final date for notifying the SFL of team additions or deletions (March
16 10/August 10)?
 - 17
 - 18 • When should clubs be notified that registered teams will not be scheduled by the SFL? If the
19 final date for defining the regions is March 10/August 10, then the notification to the clubs would
20 have to be around this time.
 - 21
 - 22 • Should regions that contain between five and nine teams be scheduled since they will end up
23 playing at least one opponent twice and possibility every opponent twice during an eight game
24 regular season?
 - 25
 - 26 • Should the Under 11 and Under 12 age groups and the Under 13 and Under 14 age groups be
27 automatically combined to make a viable regional age group of teams or should the teams be
28 dropped? Furthermore, who makes this decision, i.e., the affected clubs or the SFL?
29

30 **Example A**
31

32 Assume that a decision is made that only age groups of nine teams or more will be considered
33 viable for region and the region has four Under 13 Boys teams and six Under 14 Boys teams. If a
34 decision is made that combined age groups will be enforced when less than nine teams are
35 present in a region, then the SFL will mandate, using this example, that all 10 teams will be
36 considered as Under 14 Boys teams. In the tournament these 10 teams be considered Under 14
37 Boys teams even though other regions may have Under 13 Boys teams.
38

39 **Example B**
40

41 Assume that a decision is made that age groups of five teams or more will be considered viable
42 for region and the region has four Under 13 Boys teams and six Under 14 Boys teams. Two
43 questions arise in this situation. First, should the teams be required to be combined in the Under
44 14 Boys age group so that all 10 teams can play? If the answer is no, then who decides what

1 happens to the Under 13 Boys teams, e.g., can a club elect for them to play as Under 14s or does
2 the SFL automatically drop the Under 13 Boys teams since they are not considered viable?
3

4 **Example C**

5
6 Assume that a decision is made that age groups of five teams or more will be considered viable
7 for region and the region has four Under 13 Boys teams and four Under 14 Boys teams. Two
8 questions arise in this situation. First, should the teams be required to be combined in the Under
9 14 Boys age group so that all eight teams can play? If the answer is no, then who decides what
10 happens to the Under 13 Boys teams, e.g., can a club elect for them to play as Under 14s or does
11 the SFL automatically drop all the teams since neither group has the minimum number of teams
12 to be considered viable (five teams)?
13

- 14 • If a region is forced to combine age groups to make a given group of teams viable for that region,
15 should all other regions be forced to combine those same age groups? For example, assume that
16 the Under 13 and Under 14 age groups have eight regions and three of the regions only have
17 enough teams if the Under 13 and Under 14 Boys teams are combined. Should all regions be
18 forced to combine their Under 13 and Under 14 Boys teams or only the three regions that do not
19 have enough teams to form viable divisions unless the two age groups are combined?
20
- 21 • Should game week 9 be used for a tournament or for “Sunday” games that are caused by the
22 expected increase in odd team scheduling groups? As noted elsewhere, a rigid regional
23 scheduling structure will result in more Sunday games based on the Fall 2019 team registrations.
24 If the clubs desire to reduce those Sunday games, then the tournament can be eliminated and
25 those games played in the ninth week of the season. This may be a desirable option especially if
26 the clubs decide to allow a regional scheduling group to contain fewer than nine teams since
27 many of the teams would have already played some teams twice. Accordingly, the clubs will
28 need to decide if Sunday games should be played during the traditional regular season or
29 eliminate the tournament and play the Sunday games during the last week of the regular season.
30

Process Used to Determine Regions

Using rigid regions to drive game scheduling, i.e., teams do not play games against teams that are not in their region, requires specific field grid assignments to a given region as discussed elsewhere. Two key decisions are needed to assign the field grids to a region – (1) the field grid matrix which determines the potential travel distances for the teams assigned to a given region and (2) the approach that should be used to assign field grids to a given region. The potential travel distances associated with a given field grid matrix is discussed elsewhere. Two broad approaches can be used to assigning field grids to regions – static and flexible. As discussed below, determining static regions is fairly straight forward since all field grids in a given area are allocated to a region in straightforward manner. Flexible field grid regions are more complex and have several variations.

Comparing Static and Flexible Field Grid Options

Two broad approaches can be used to assign field grids to a given region – static and flexible. The static approach simply takes the available field grids for field assignments and then starting with field grid 1, assigning the proper number of field grids to accomplish the desired field grid matrix for a region. For example, assume that a two field grid matrix is desired for each region, the static approach would assign field grids, 1, 2, 11, and 12 to Region 1 even if only field grid 12 had teams assigned to it. This approach is commonly referred to as the Static Field Grid Region approach. The flexible field grid approach still maintains the desired field grid matrix but starts the region on a field grid that optimizes the teams assigned to a given region. Continuing the above example, the flexible field grid approach would start the Region 1 field grid definition with field grid 12 and include field grids 13, 22, and 23.⁷ This approach is commonly referred to as the Flexible Field Grid approach. A review of teams assigned to the field grids showed that a Flexible Field Grid approach should be used to define regions.

A further refinement to the Flexible Field Grid approach is to tailor the regions to the age group demographics associated with the field grids. This is commonly referred to as Flexible Age Group Field Grid approach. The following illustrates the difference between the Flexible Field Grid and Flexible Age Group Field Grid approaches using the Fall 2019 Under 11 Boys and Under 14 Boys teams.

Standard Regions Using A Flexible Field Grid Approach for Region Definitions – 3 Field Grid Matrix

Region	Field Grids	Under 11 Boys Teams	Under 14 Boys Teams
Region 1	2 – 4, 12 – 14, 22 – 24	No Teams	1 Team
Region 2	17 – 19, 27 – 29, 37 – 39	1 Team	3 Teams

⁷ For this example, it is assumed that field grid 21 also does not have any teams assigned to it.

Region	Field Grids	Under 11 Boys Teams	Under 14 Boys Teams
Region 3	42 – 44, 52 – 54, 62 – 64	11 Teams	9 Teams
Region 4	45 – 47, 55 – 57, 65 – 67	8 Teams	11 Teams
Region 5	48 – 50, 58 – 60, 68 – 70	No Teams	9 Teams
Region 6	75 – 77, 85 – 87, 95 – 97	10 Teams	19 Teams

Regions Using A Flexible Age Group Field Grid Approach for Region Definitions – 3 Field Grid Matrix

Region	Under 11 Boys Field Grids	Under 14 Boys Field Grids	Teams
Region 1	Region Not Used	2 – 4, 12 – 13, 22 – 24	0/1 Teams
Region 2	17 – 19, 27 – 29, 37 – 39	Same	1/3 Teams
Region 3	43 – 45, 53 – 55, 63 – 65	42 – 44, 52 – 54, 62 – 64	19/9 Teams
Region 4	Region Not Used	45 – 47, 55 – 57, 65 – 67	0/11 Teams
Region 5	Region Not Used	48 – 50, 58 – 60, 68 – 70	0/9 Teams
Region 6	75 – 77, 85 – 87, 95 – 97	75 – 77, 85 – 87, 95 – 97	12/19 Teams

As can be seen in these two tables, the Flexible Age Group Field Grid Approach allows a better grouping of teams since more teams can be placed in a given region. Specifically, although flexible regions were used, when the same field grids are used to define the regions for all age groups, the Under 11 Boys are found in 4 regions while defining flexible regions based on the age group allows the Under 11 Boys to be concentrated in 3 regions.

Approaches for Developing Flexible Age Group Field Grid Regions

As illustrated above, the Flexible Age Group Field Grid Approach allows a better grouping of teams since more teams can be placed in a given region. The key for implementing the approach is to determine the variation that best meets the needs of the organization. Several variations are available and that include the following.

- **Using specific age groups** – Under this approach the best field grid configuration for each age group, e.g., Under 11 Girls, Under 11 Boys, Under 12 Girls, etc., is used to determine each region. This is the approach illustrated above.
- **Using general age groups** – Under this approach the best field grid configuration for each broad age group, e.g., Under 11s, Under 12s, etc., is used to determine each region. This approach

1 addresses a potential limitation with specific age group approach since a given age group, e.g.,
2 Under 11 Girls may not have teams in a region but will in future seasons since it is logical that if
3 a region has Under 11 Boys teams, Under 11 Girls teams may come later.
4

- 5 • **Using potential scheduling age groups** – Under this approach, the best field grid configuration
6 for a given potential age group combination, Under 11s and Under 12s, Under 13s and Under
7 14s, etc., is used to determine each region. As noted elsewhere, when a region has less than five
8 teams in a given age group, age groups may be combined to achieve the desired team count. This
9 approach provides reasonable assurance that the same regions used to determine whether enough
10 teams can support a region in a given age group are the same regions used to determine whether
11 combining the age groups will provide the necessary teams. A review of the Under 16 and 19
12 teams showed that they were generally assigned the same field grids. Accordingly, these age
13 groups could use the same regions although they probably would not be combined for scheduling
14 purposes.
15

16 Because of the flexibility provided by the defining regions based on the potential scheduling age groups,
17 this is the alternative used to define the regions used for the analysis of the impacts of regional
18 scheduling alternatives.
19
20
21
22
23
24
25

1	R1 - Grid 2 U12B(1) U11G(1)	R1 - Grid 3	4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	14	15	16	R2 - Grid 17 U11B(1) U12B(2) U11G(1) U12G(4)	R2 - Grid 18	19	20
21	22	23	24	25	26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	R3 - Grid 53 U11B(3) U12B(2) U11G(2) U12G(1)	R3 - Grid 54 U11B(4) U12B(5) U11G(3) U12G(2)	R4 - Grid 55 U11B(5) U12B(6) U11G(3) U12G(3)	R4 - Grid 56	57	58	59	60
61	62	R3 - Grid 63	R3 - Grid 64 U11B(4) U12B(5) U11G(2) U12G(4)	R4 - Grid 65 U11B(3) U12B(4) U11G(1) U12G(2)	R4 - Grid 66	67	68	69	70
71	72	73	74	R5 - Grid 75 U12B(6) U12G(3)	R5 - Grid 76 U11B(5) U12B(5) U12G(8)	R6 - Grid 77	R6 - Grid 78	79	80
81	82	83	84	R5 - Grid 85 U11B(2) U12B(4) U11G(2) U12G(1)	R5 - Grid 86	R6 - Grid 87 U11B(3) U12B(5) U11G(4) U12G(4)	R6 - Grid 88	89	90
91	92	93	94	95	96	97	98	99	100

1	R1 - Grid 2 U11/12B(1) U11/12G(1)	R1 - Grid 3	4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	14	15	16	R2 - Grid 17 U11/12B(3) U11/12G(5)	R2 - Grid 18	19	20
21	22	23	24	25	26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	R3 - Grid 53 U11/12B(5) U11/12G(3)	R3 - Grid 54 U11/12B(9) U11/12G(5)	R4 - Grid 55 U11/12B(11) U11/12G(6)	R4 - Grid 56	57	58	59	60
61	62	R3 - Grid 63	R3 - Grid 64 U11/12B(9) U11/12G(6)	R4 - Grid 65 U11/12B(7) U11/12G(3)	R4 - Grid 66	67	68	69	70
71	72	73	74	R5 - Grid 75 U11/12B(6) U11/12G(3)	R5 - Grid 76 U11/12B(10) U11/12G(8)	R6 - Grid 77	R6 - Grid 78	79	80
81	82	83	84	R5 - Grid 85 U11/12B(6) U11/12G(3)	R5 - Grid 86	R6 - Grid 87 U11/12B(8) U11/12G(8)	R6 - Grid 88	89	90
91	92	93	94	95	96	97	98	99	100

1	R1 - Grid 2 U14B(1) U13G(1)	R1 - Grid 3	4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	14	15	16	R2 - Grid 17 U13B(2), U14B(3) U13G(2) U14G(2)	R2 - Grid 18	19	20
21	22	23	24	25	26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	R3 - Grid 37	R3 - Grid 38	39	40
41	42	43	44	45	46	R3 - Grid 47 U13B(5), U14B(5) U13G(4) U14G(2)	R3 - Grid 48	49	50
51	52	R4 - Grid 53 U13B(2), U14B(2) U13G(1) U14G(1)	R4 - Grid 54 U13B(6), U14B(4) U13G(4) U14G(2)	R5 - Grid 55	R5 - Grid 56 U13B(3), U14B(3) U13G(3) U14G(3)	R6 - Grid 57	R6 - Grid 58 U13B(3), U14B(4) U13G(1) U14G(5)	R7 - Grid 59	R7 - Grid 60
61	62	R4 - Grid 63	R4 - Grid 64 U14B(3) U14G(2)	R5 - Grid 65 U13G(2) U14G(2)	R5 - Grid 66 U13B(4), U14B(3) U14G(2)	R6 - Grid 67 U13G(3) U14G(3)	R6 - Grid 68 U13B(6) U13G(2)	R7 - Grid 69 U14B(5) U14G(2)	R7 - Grid 70
71	72	73	R8 - Grid 74	R8 - Grid 75 U13B(4), U14B(3) U13G(3) U14G(2)	R9 - Grid 76 U13B(11), U14B(11) U13G(3) U14G(4)	R9 - Grid 77	78	79	80
81	82	83	R8 - Grid 84	R8 - Grid 85 U13B(1), U14B(1) U13G(1) U14G(1)	R9 - Grid 86 U13B(1), U14B(2) U14G(3)	R9 - Grid 87 U13B(2), U14B(2) U13G(3) U14G(6)	88	89	90
91	92	93	94	95	96	97	98	99	100

1	R1 - Grid 2 U13/14B(1) U13/14G(1)	R1 - Grid 3	4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	14	15	16	R2 - Grid 17 U13/14B(5) U13/14G(4)	R2 - Grid 18	19	20
21	22	23	24	25	26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	R3 - Grid 37	R3 - Grid 38	39	40
41	42	43	44	45	46	R3 - Grid 47 U13/14B(10) U13/14G(6)	R3 - Grid 48	49	50
51	52	R4 - Grid 53 U13/14B(4) U13/14G(2)	R4 - Grid 54 U13/14B(10) U13/14G(6)	R5 - Grid 55	R5 - Grid 56 U13/14B(6) U13/14G(6)	R6 - Grid 57	R6 - Grid 58 U13/14B(7) U13/14G(6)	R7 - Grid 59	R7 - Grid 60
61	62	R4 - Grid 63	R4 - Grid 64 U13/14B(3) U13/14G(2)	R5 - Grid 65 U13/14G(4)	R5 - Grid 66 U13/14B(7) U13/14G(2)	R6 - Grid 67 U13/14G(6)	R6 - Grid 68 U13/14B(6) U13/14G(2)	R7 - Grid 69 U13/14B(5) U13/14G(2)	R7 - Grid 70
71	72	73	R8 - Grid 74	R8 - Grid 75 U13/14B(7) U13/14G(5)	R9 - Grid 76 U13/14B(22) U13/14G(7)	R9 - Grid 77	78	79	80
81	82	83	R8 - Grid 84	R8 - Grid 85 U13/14B(2) U13/14G(2)	R9 - Grid 86 U13/14B(3) U13/14G(3)	R9 - Grid 87 U13/14B(4) U13/14G(9)	88	89	90
91	92	93	94	95	96	97	98	99	100

1	R1 - Grid 2 U16B(1)	R1 - Grid 3	4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	14	15	16	R2 - Grid 17 U16B(2) U19B(1) U16G(2) U19G(1)	R2 - Grid 18	19	20
21	22	23	24	25	26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	R3 - Grid 43 U16B(2) U19B(4) U19G(2)	R3 - Grid 44	R4 - Grid 45 U16B(2) U16G(1) U19G(1)	R4 - Grid 46	R5 - Grid 47 U16B(7) U19B(4) U16G(7) U19G(6)	R5 - Grid 48	49	50
51	52	R3 - Grid 53 U16B(3) U19B(2) U16G(2) U19G(1)	R3 - Grid 54 U16B(9) U19B(4) U16G(5) U19G(2)	R4 - Grid 55 U16B(1) U19B(1) U19G(4)	R4 - Grid 56 U16B(4) U19B(2) U16G(5)	R5 - Grid 57	R5 - Grid 58 U16B(3) U19B(4) U16G(2) U19G(3)	59	60
61	62	63	R6 - Grid 64 U16B(3) U19B(2) U16G(3) U19G(1)	R6 - Grid 65 U16B(2) U19B(2) U16G(1) U19G(1)	R7 - Grid 66 U16B(3) U19B(2) U16G(1) U19G(2)	R7 - Grid 67 U16B(5) U19B(2) U16G(5)	R8 - Grid 68 U16B(7) U19G(4)	R8 - Grid 69 U19B(5) U16G(3)	70
71	72	73	R6 - Grid 74	R6 - Grid 75 U16B(4) U19B(3) U16G(3) U19G(4)	R7 - Grid 76 U16B(8) U19B(6) U16G(3) U19G(6)	R7 - Grid 77	R8 - Grid 78	R8 - Grid 79	80
81	82	83	R9 - Grid 84	R9 - Grid 85 U19B(1) U16G(2)	R10 - Grid 86 U16B(4) U19B(4) U16G(1) U19G(2)	R10 - Grid 87 U16B(4) U19B(4) U16G(4) U19G(1)	88	89	90
91	92	93	R9 - Grid 94	R9 - Grid 95	R10 - Grid 96	R10 - Grid 97	98	99	100

1	R1 - Grid 2 U12B(1) U11G(1)	R1 - Grid 3	R1 - Grid 4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	R1 - Grid 14	15	R2 - Grid 16	R2 - Grid 17 U11B(1) U12B(2) U11G(1) U12G(4)	R2 - Grid 18	19	20
21	R1 - Grid 22	R1 - Grid 23	R1 - Grid 24	25	R2 - Grid 26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	R2 - Grid 36	R2 - Grid 37	R2 - Grid 38	39	40
41	42	R3 - Grid 43	R3 - Grid 44	R3 - Grid 45	46	47	48	49	50
51	52	R3 - Grid 53 U11B(3) U12B(2) U11G(2) U12G(1)	R3 - Grid 54 U11B(4) U12B(5) U11G(3) U12G(2)	R3 - Grid 55 U11B(5) U12B(6) U11G(3) U12G(3)	56	57	58	59	60
61	62	R3 - Grid 63	R3 - Grid 64 U11B(4) U12B(5) U11G(2) U12G(4)	R3 - Grid 65 U11B(3) U12B(4) U11G(1) U12G(2)	66	67	68	69	70
71	72	73	74	R4 - Grid 75 U12B(6) U12G(3)	R4 - Grid 76 U11B(5) U12B(5) U12G(8)	R4 - Grid 77	78	79	80
81	82	83	84	R4 - Grid 85 U11B(2) U12B(4) U11G(2) U12G(1)	R4 - Grid 86	R4 - Grid 87 U11B(3) U12B(5) U11G(4) U12G(4)	88	89	90
91	92	93	94	R4 - Grid 95	R4 - Grid 96	R4 - Grid 97	98	99	100

1	R1 - Grid 2 U11/12B(1) U11/12G(1)	R1 - Grid 3	R1 - Grid 4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	R1 - Grid 14	15	R2 - Grid 16	R2 - Grid 17 U11/12B(3) U11/12G(5)	R2 - Grid 18	19	20
21	R1 - Grid 22	R1 - Grid 23	R1 - Grid 24	25	R2 - Grid 26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	R2 - Grid 36	R2 - Grid 37	R2 - Grid 38	39	40
41	42	R3 - Grid 43	R3 - Grid 44	R3 - Grid 45	46	47	48	49	50
51	52	R3 - Grid 53 U11/12B(5) U11/12G(3)	R3 - Grid 54 U11/12B(9) U11/12G(5)	R3 - Grid 55 U11/12B(11) U11/12G(6)	56	57	58	59	60
61	62	R3 - Grid 63	R3 - Grid 64 U11/12B(9) U11/12G(6)	R3 - Grid 65 U11/12B(7) U11/12G(3)	66	67	68	69	70
71	72	73	74	R4 - Grid 75 U11/12B(6) U11/12G(3)	R4 - Grid 76 U11/12B(10) U11/12G(8)	R4 - Grid 77	78	79	80
81	82	83	84	R4 - Grid 85 U11/12B(6) U11/12G(3)	R4 - Grid 86	R4 - Grid 87 U11/12B(8) U11/12G(8)	88	89	90
91	92	93	94	R4 - Grid 95	R4 - Grid 96	R4 - Grid 97	98	99	100

1	R1 - Grid 2 U14B(1) U13G(1)	R1 - Grid 3	R1 - Grid 4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	R1 - Grid 14	15	R2 - Grid 16	R2 - Grid 17 U13B(2), U14B(3) U13G(2) U14G(2)	R2 - Grid 18	19	20
21	R1 - Grid 22	R1 - Grid 23	R1 - Grid 24	25	R2 - Grid 26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	R2 - Grid 36	R2 - Grid 37	R2 - Grid 38	39	40
41	R3 - Grid 42	R3 - Grid 43	R3 - Grid 44	R4 - Grid 45	R4 - Grid 46 U13B(5), U14B(5) U13G(4) U14G(2)	R4 - Grid 47	R5 - Grid 48	R5 - Grid 49	R5 - Grid 50
51	R3 - Grid 52	R3 - Grid 53 U13B(2), U14B(2) U13G(1) U14G(1)	R3 - Grid 54 U13B(6), U14B(4) U13G(4) U14G(2)	R4 - Grid 55	R4 - Grid 56 U13B(3), U14B(3) U13G(3) U14G(3)	R4 - Grid 57	R5 - Grid 58 U13B(3), U14B(4) U13G(1) U14G(5)	R5 - Grid 59	R5 - Grid 60
61	R3 - Grid 62	R3 - Grid 63	R3 - Grid 64 U14B(3) U14G(2)	R4 - Grid 65 U13G(2) U14G(2)	R4 - Grid 66 U13B(4), U14B(3) U14G(2)	R4 - Grid 67 U13G(3) U14G(3)	R5 - Grid 68 U13B(6) U13G(2)	R5 - Grid 69 U14B(5) U14G(2)	R5 - Grid 70
71	72	73	74	R6 - Grid 75 U13B(4), U14B(3) U13G(3) U14G(2)	R6 - Grid 76 U13B(11), U14B(11) U13G(3) U14G(4)	R6 - Grid 77	78	79	80
81	82	83	84	R6 - Grid 85 U13B(1), U14B(1) U13G(1) U14G(1)	R6 - Grid 86 U13B(1), U14B(2) U14G(3)	R6 - Grid 87 U13B(2), U14B(2) U13G(3) U14G(6)	88	89	90
91	92	93	94	R6 - Grid 95	R6 - Grid 96	R6 - Grid 97	98	99	100

1	R1 - Grid 2 U13/14B(1) U13/14G(1)	R1 - Grid 3	R1 - Grid 4	5	6	7	8	9	10
11	R1 - Grid 12	R1 - Grid 13	R1 - Grid 14	15	R2 - Grid 16	R2 - Grid 17 U13/14B(5) U13/14G(4)	R2 - Grid 18	19	20
21	R1 - Grid 22	R1 - Grid 23	R1 - Grid 24	25	R2 - Grid 26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	R2 - Grid 36	R2 - Grid 37	R2 - Grid 38	39	40
41	R3 - Grid 42	R3 - Grid 43	R3 - Grid 44	R4 - Grid 45	R4 - Grid 46	R4 - Grid 47 U13/14B(10) U13/14G(6)	R5 - Grid 48	R5 - Grid 49	R5 - Grid 50
51	R3 - Grid 52	R3 - Grid 53 U13/14B(4) U13/14G(2)	R3 - Grid 54 U13/14B(10) U13/14G(6)	R4 - Grid 55	R4 - Grid 56 U13/14B(6) U13/14G(6)	R4 - Grid 57	R5 - Grid 58 U13/14B(7) U13/14G(6)	R5 - Grid 59	R5 - Grid 60
61	R3 - Grid 62	R3 - Grid 63	R3 - Grid 64 U13/14B(3) U13/14G(2)	R4 - Grid 65 U13/14G(4)	R4 - Grid 66 U13/14B(7) U13/14G(2)	R4 - Grid 67 U13/14G(6)	R5 - Grid 68 U13/14B(6) U13/14G(2)	R5 - Grid 69 U13/14B(5) U13/14G(2)	R5 - Grid 70
71	72	73	74	R6 - Grid 75 U13/14B(7) U13/14G(5)	R6 - Grid 76 U13/14B(22) U13/14G(7)	R6 - Grid 77	78	79	80
81	82	83	84	R6 - Grid 85 U13/14B(2) U13/14G(2)	R6 - Grid 86 U13/14B(3) U13/14G(3)	R6 - Grid 87 U13/14B(4) U13/14G(9)	88	89	90
91	92	93	94	R6 - Grid 95	R6 - Grid 96	R6 - Grid 97	98	99	100

1	R1 - Grid 2 U16B(1)	R1 - Grid 3	R1 - Grid 4	5	R2 - Grid 6	R2 - Grid 7	R2 - Grid 8	9	10
11	R1 - Grid 12	R1 - Grid 13	R1 - Grid 14	15	R2 - Grid 16	R2 - Grid 17 U16B(2) U19B(1) U16G(2) U19G(1)	R2 - Grid 18	19	20
21	R1 - Grid 22	R1 - Grid 23	R1 - Grid 24	25	R2 - Grid 26	R2 - Grid 27	R2 - Grid 28	29	30
31	32	33	34	35	36	R3 - Grid 37	R3 - Grid 38	R3 - Grid 39	40
R4 - Grid 41	R4 - Grid 42	R4 - Grid 43 U16B(2) U19B(4) U19G(2)	R5 - Grid 44	R5 - Grid 45 U16B(2) U16G(1) U19G(1)	R5 - Grid 46	R3 - Grid 47 U16B(7) U19B(4) U16G(7) U19G(6)	R3 - Grid 48	R3 - Grid 49	50
R4 - Grid 51	R4 - Grid 52	R4 - Grid 53 U16B(3) U19B(2) U16G(2) U19G(1)	R5 - Grid 54 U16B(9) U19B(4) U16G(5) U19G(2)	R5 - Grid 55 U16B(1) U19B(1) U19G(4)	R5 - Grid 56 U16B(4) U19B(2) U16G(5)	R3 - Grid 57	R3 - Grid 58 U16B(3) U19B(4) U16G(2) U19G(3)	R3 - Grid 59	60
R4 - Grid 61	R4 - Grid 62	R4 - Grid 63	R5 - Grid 64 U16B(3) U19B(2) U16G(3) U19G(1)	R5 - Grid 65 U16B(2) U19B(2) U16G(1) U19G(1)	R5 - Grid 66 U16B(3) U19B(2) U16G(1) U19G(2)	R6 - Grid 67 U16B(5) U19B(2) U16G(5)	R6 - Grid 68 U16B(7) U19G(4)	R6 - Grid 69 U19B(5) U16G(3)	70
71	72	73	R7 - Grid 74	R7 - Grid 75 U16B(4) U19B(3) U16G(3) U19G(4)	R7 - Grid 76 U16B(8) U19B(6) U16G(3) U19G(6)	R6 - Grid 77	R6 - Grid 78	R6 - Grid 79	80
81	82	83	R7 - Grid 84	R7 - Grid 85 U19B(1) U16G(2)	R7 - Grid 86 U16B(4) U19B(4) U16G(1) U19G(2)	R6 - Grid 87 U16B(4) U19B(4) U16G(4) U19G(1)	R6 - Grid 88	R6 - Grid 89	90
91	92	93	R7 - Grid 94	R7 - Grid 95	R7 - Grid 96	97	98	99	100