



Miami-Dade Board of County Commissioners
Office of the Commission Auditor

Formula 1 Race Hosting

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The Office of the Commission Auditor, Miami-Dade Board of County Commissioners

The Office of the Commission Auditor (OCA) was established in September 2002 by Ordinance 03-2 to provide support and professional analysis of the policy, service, budgetary, and operational issues before the Miami-Dade Board of County Commissioners. The Commission Auditor's duties include reporting to the Board of County Commissioners (BCC) on the fiscal operations of County departments, as well as whether or not the fiscal and legislative policy directions of the Commission are being efficiently and effectively implemented.

The Office of the Commission Auditor (OCA) prepared this summary report in response to a request from Miami-Dade County Commissioner Barbara J. Jordan, representing District 1. This request and the summary provided by OCA is in accordance with Sec. 2-478 (3) of the Code of Miami-Dade County.

This summary is for discussion purposes in addition to identifying topics that will require further comprehensive analysis and the use of specialized testing equipment. This summary report, prepared in collaboration with subject matter experts, is substantially less detailed in scope than an audit in accordance with the Generally Accepted Auditing Standards (GAAS). The Office of the Commission Auditor does not express an opinion on the data gathered by the subject matter expert.

I. Purpose

The Office of the Commission Auditor (OCA) is preparing a summary of information related to the Formula 1 (F1) racing circuit. The key goals will be to discuss the F1's relevant history, operations, and identify any impact of hosting such racing events to the host city.

II. Objectives

OCA's objectives on this directive are as follows:

1. Summarize all pertinent background and history of the F1 racing circuit.
2. Identify challenges experienced by previous host cities.
3. Identify and categorize any environmental impact that should be considered by the host community before and after the racing event.

III. Background

The Fédération Internationale de l'Automobile (FIA) is the governing body for all auto racing events including the Formula 1 series, it is headquartered in Paris, France and consist of 246 member organizations¹ in 145 countries worldwide.

The reason why the sport is called "Formula" One F1 is rooted in history. Pioneer motor racing placed no limitations on the size or power of the competing cars. With technological advances, this free-for-all quickly made for ludicrously dangerous conditions, especially as the early races were fought out on public roads. As a result, the governing body of the sport at the time began imposing key limitations on the format of the cars in terms of power, weight, and size. Only cars complying with this "formula" of rules could compete. The rules formulated for racing immediately after World War II were given the tag of "Formula One".²

The first Formula 1 race was the Turin Grand Prix that was hosted by Turin Italy on September 1, 1946, in the following years since inception, there have been over one thousand (1,000) races hosted in 31 countries.³ It has continued to grow globally with over 500 million fans and an estimated cumulative audience of 1.59 billion in 2018.⁴

In more recent history, Formula One (F1) was acquired in January 2017 by the investment firm Liberty Media, which is based in Colorado and listed on the Nasdaq with the ticker FWONK. Liberty Media completed this acquisition of Formula One (F1) with the goal of hosting more F1 races in the United States.⁵

¹ <https://www.fia.com/members>

² <https://www.dummies.com/sports/auto-racing/discovering-what-makes-formula-one-formula-one/>

³ <https://www.statsf1.com/en/circuits.aspx>

⁴ <https://f1i.com/news/328041-formula-1-reports-rise-in-tv-viewership-for-2018.html>

⁵ <https://f1i.com/news/351014-carey-f1-making-good-headway-with-second-us-race.html>

Host Countries

The list below reflects all the host countries and circuits of the F1 races since its inception.

Countries	Circuits	Begin in	Events
Argentina	Buenos Aires	1953	20
Australia	Adelaïde	1985	11
Australia	Melbourne	1996	24
Austria	Österreichring	1970	18
Austria	Spielberg	1997	13
Austria	Zeltweg	1964	1
Azerbaijan	Bakou	2016	4
Bahrain	Sakhir	2004	15
Belgium	Nivelles	1972	2
Belgium	Spa-Francorchamps	1950	52
Belgium	Zolder	1973	10
Brazil	Interlagos	1973	36
Brazil	Jacarepagua	1978	10
Canada	Montréal	1978	40
Canada	Mont-Tremblant	1968	2
Canada	Mosport Park	1967	8
China	Shanghai	2004	16
France	Clermont-Ferrand	1965	4
France	Dijon-Prenois	1974	6
France	Le Castellet	1971	16
France	Le Mans	1967	1
France	Magny-Cours	1991	18
France	Reims	1950	11
France	Rouen-les-Essarts	1952	5
Germany	Avus	1959	1
Germany	Hockenheim	1970	37
Germany	Nürburgring	1951	40
Hungary	Hungaroring	1986	34
India	New Delhi	2011	3
Italy	Imola	1980	27
Italy	Monza	1950	69
Italy	Pescara	1957	1
Japan	Aïda	1994	2
Japan	Fuji	1976	4
Japan	Suzuka	1987	30
Malaysia	Kuala Lumpur	1999	19
Mexico	Mexico City	1963	19
Monaco	Monaco	1950	66
Morocco	Ain-Diab	1958	1
Netherlands	Zandvoort	1952	30
Portugal	Estoril	1984	13
Portugal	Monsanto	1959	1
Portugal	Porto	1958	2
Russia	Sochi	2014	5
Singapore	Singapour	2008	11
South Africa	East London	1962	3
South Africa	Kyalami	1967	20

Cont.			
Countries	Circuits	Begin in	Events
South Korea	Yeongam	2010	4
Spain	Barcelone	1991	29
Spain	Jarama	1968	9
Spain	Jerez de la Frontera	1986	7
Spain	Montjuïc Park	1969	4
Spain	Pedralbes	1951	2
Spain	Valencia	2008	5
Sweden	Anderstorp	1973	6
Switzerland	Bremgarten	1950	5
Turkey	Istanbul	2005	7
United Arab Emirates	Yas Marina	2009	10
United Kingdom	Aintree	1955	5
United Kingdom	Brands Hatch	1964	14
United Kingdom	Donington	1993	1
United Kingdom	Silverstone	1950	53
USA	Austin	2012	7
USA	Caesars Palace	1981	2
USA	Dallas	1984	1
USA	Detroit	1982	7
USA	Indianapolis	1950	19
USA	Long Beach	1976	8
USA	Phoenix	1989	3
USA	Riverside	1960	1
USA	Sebring	1959	1
USA	Watkins Glen	1961	20

United States Hosting Summary

1. Long Beach CA, Long Beach Grand Prix (1976-1983) *
2. Riverside- Moreno Valley, California (1958, 1960) *
3. Las Vegas, Caesar's Palace Grand Prix (1981-1982) *
4. Phoenix (1989-1991) *
5. Fair Park, Dallas Grand Prix (1984) *
6. Circuit of the Americas -Austin TX (2012-present) *
7. Detroit, Detroit Grand Prix (1982-1988) *
8. Indianapolis (2000-2007) *
9. Watkins Glen- New York (1961-1980) *
10. Sebring International Raceway, Sebring, Florida (1959) *
11. San Francisco, American Grand Prize (1915)
12. Santa Monica, American Grand Prize (1914, 1916)
13. Milwaukee, American Grand Prize (1912)
14. Roosevelt Park- New York, Vanderbilt Cup (1936-1937)
15. Savannah GA, American Grand Prize (1908-1911)

*Formula 1 events

United States Race Hosting History

The map below shows all locations in the United States that have hosted a Formula 1 race and the years (Only 10 of the 15 events were officially Formula 1).



Fiscal Snapshot

Formula 1 Revenue⁶

2018	\$1.827 Billion
2017	\$1.783 Billion

Total payments to the teams:⁷

2018	\$913 million
2017	\$919 million

Number of races

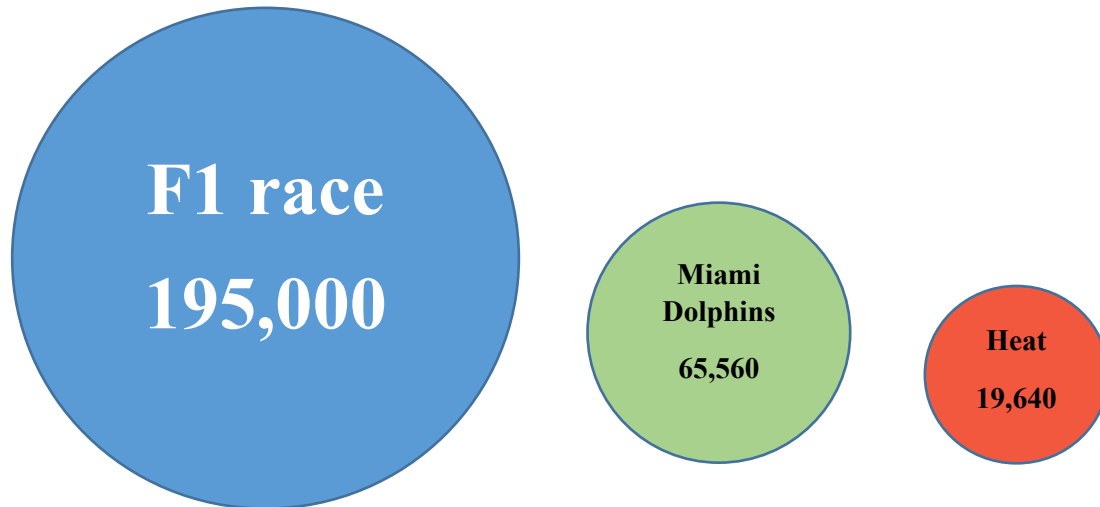
2018-	21
2017-	20

⁶ <http://ir.libertymedia.com/static-files/26a9bbc2-bd8d-42ca-b089-1532162098a1>

⁷ <http://ir.libertymedia.com/news-releases/news-release-details/liberty-media-corporation-reports-fourth-quarter-and-year-end-1>

Attendance Comparison

- Average attendance per F1 race weekend for 2018 was 195,000 ⁸
- Average attendance at home games for the Miami Dolphins in 2018 was 65,560⁹
- Average attendance at home games for the Miami Heat in 2018 was 19,640¹⁰



Sample of Contractual Terms

The F1 racing organization and its partnered promoters usually negotiate a wide range of incentives and obligations with the host city, some of the typical contractual terms used in a hosting agreement centers around the following clauses:

1. Hosting agreements normally call for a 10-year term with the host city.¹¹
2. Giving the F1 promoter access to City properties and locations during the “Event Window”, the duration of the window is normally 3 weeks, which includes fourteen days (14) days before the relevant event and seven (7) days after the end of the last day of that event.
3. Internship and Vocational Opportunities: In connection with each event, the promoters and Formula 1 provide internship and/or vocational opportunities to a specific number of students that reside in the host City.
4. Formula 1 Promoters set aside an allocation of race passes to be distributed to high achieving "STEM" students in schools located in communities identified by the host City as being under resourced and coordinate with local schools to make the "F1 In Schools Program" available in schools within the host City.

⁸ <https://www.formula1.com/en/latest/article.f1-race-weekends-attended-by-over-four-million-fans-in-2018.IILWTUMmCkWAaGE4aYGo.html>

⁹ <https://www.statista.com/statistics/250074/average-home-attendance-of-the-miami-dolphins/>

¹⁰ <https://www.statista.com/statistics/197541/nba-home-attendance-of-the-miami-heat-since-2006/>

¹¹ City of Miami Host City Agreement

5. Formula 1 and its promoters usually require a Clean Zone ordinance which shall be coterminous with the contractual term, the purpose of this ordinance is to provide for the temporary prohibition of certain permits within the Clean Zone areas, prohibition of transaction of certain business and/or commercial activity, establishment of public participation areas, and to provide for the establishment of fines and penalties for violations of this ordinance.
6. Air quality and environmental initiatives: ¹²
 - Work with Host City and relevant governmental entities to establish, an Air Quality analysis and inventory, modeling, and a mitigation strategy to resolve air quality issues related to major events. Commit to securing data that allows assessment of emissions specific to the site.
 - Purchase carbon offsets to achieve carbon neutrality for the net carbon emissions associated with all fuel use and energy demands associated with the Formula One race, to include race operations during the event and temporary generation.

Concerns in host cities

Since its inception, the F1 circuit has faces various concerns from host cities as the population became engaged about the environmental impact and inconveniences of hosting such events. There are four major categories of concerns that communities have raised as it relates to hosting F1 events, they are as follows:

1. Noise Pollution
2. Air Pollution
3. Light Pollution
4. Traffic Inconvenience and Road Closures

Noise pollution

Noise pollution refers to sounds in the environment that are caused by humans and that threaten the health or welfare of human or animal inhabitants. The most common source of noise pollution by far, the one that affects the most people on the planet, is motor vehicles. Aircraft and industrial machinery are also major sources. Additional noise pollution is contributed by office machines, sirens, power tools, and other equipment.¹³

In a 2013 study, a professor in acoustical engineering at the University of Texas at Austin measured the noise at three different points on the track, at its loudest, it measured close to 140dB this is above the pain threshold¹⁴, which is about as loud as a jet airplane from 100 feet. To put this in perspective, if you must yell for someone who is three feet away to hear, you are most likely experiencing a noise level of over 85 dB.

In 2014, the sport's governing body FIA enacted new regulation to reduce engine noise levels. The sound pressure level for the new cars is 11 decibels lower than before (134 dB compared to the previous 145 dB).¹⁵ Although an improvement, 134 dB is still a considerable noise level that can pose health risks. In comparison, the decibels experienced during a rock concert ranges between 100 dB and 120 dB).

¹² https://austintexas.gov/sites/default/files/files/MotoGp2018_EtfAgreementCotaCity.pdf

¹³ <https://www.noisehelp.com/what-is-noise-pollution.html>

¹⁴ <https://www.livescience.com/41684-formula-1-racing-noisy.html>

¹⁵ <https://www.racefans.net/2014/03/11/new-engines-much-quieter-v8s-fia-says/>

Noise Thermometer¹⁶

The chart below shows noise decibel levels from 30 dB to 140 dB, it also reflects the exposure time to those noise levels that can cause hearing damage.

NOISE Thermometer™



Decibel (dB) + Time = Potential for hearing loss
Reduce exposure time in half with each additional 3 dB(A) (Source: NIOSH)

¹⁶ <https://www.henryford.com/services/hearing/conditions/what-is-hearing-loss/hearing-loss-prevention>

Air Pollution

Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust, pollen and mold spores may be suspended as particles. Some air pollutants are poisonous. Inhaling them can increase the chance you'll have health problems. People with heart or lung disease, older adults and children are at greater risk from air pollution.¹⁷

Concerns about the F1 event's impact on air pollution centers around the fact that the teams in Formula One spend almost as much time in the air, as they do on the ground. They each transport between 50 and 100 tons of cars, spare parts, and equipment to each of the 21 races on the calendar, covering more than 110,000 air miles every year¹⁸. Also, teams bring mobile headquarters and hospitality centers with them to the host cities.

The air pollution data of F1 events have not been historically measured, it has been noted that the tires of race cars, which shred into tiny (tire degradation), invisible particles over the course of the race, do give off poisonous dust.¹⁹



¹⁷ <https://medlineplus.gov/airpollution.html>

¹⁸ <https://cleantechnica.com/2019/04/30/the-gigantic-carbon-footprint-of-formula-one/>

¹⁹ <http://www.montrealgazette.com/sports/debate+continues+over+much+race+cars+pollute+environment/9919288/story.html>

Light Pollution²⁰

Light pollution is excessive, misdirected, or obtrusive artificial (usually outdoor) light. Too much light pollution has consequences: it washes out starlight in the night sky, interferes with astronomical research, disrupts ecosystems, has adverse health effects, and wastes energy.

In disrupting ecosystems, light pollution poses a serious threat to nocturnal wildlife, having negative impacts on plant and animal physiology. It can confuse the migratory patterns of animals, alter competitive interactions of animals, change predator-prey relations, and cause physiological harm. The rhythm of life is orchestrated by the natural diurnal patterns of light and dark, so disruption to these patterns impacts the ecological dynamics.²¹

The concerns of the F1 race's contribution to light pollution is attributed to the planning and construction phase of the event, which requires bright lights in the construction areas weeks before the actual racing event.

Sample photo of the F1 Race Construction- Yas Marina Circuit Abu Dhabi



²⁰ <https://seeclifix.com/issues/4005435-excessive-light-pollution-from-new-construction-vacant-building>

²¹ <https://www.globeatnight.org/light-pollution.php>

Critical Habitat

Threatened wildlife includes species, subspecies, or isolated populations that are likely to become endangered soon unless steps are taken to protect and manage the species and its habitat for its survival.²²

South Florida has been well known for its protected species and ecosystems; these species depend on the uninterrupted flow of their natural migration patterns and undisturbed natural habitat. Noise and light pollution pose a threat or could cause disruption to these species, studies related to critical habitats surrounding the hosting sites, and migration patterns that interact with areas close to the hosting sites could help understand and create a strategic plan to reduce any negative impact.

Critical Habitat (Features: 11, Selected: 0)		
COMNAME ▲	SCINAME	CONSERVID
American crocodile	Crocodylus acutus	T
Bald Eagle	Haliaeetus leucocephalus	T
Bartram's scrub-hairstreak	Strymon acis	E
Cape Sable seaside sparrow	Ammodramus maritimus mirabilis	E
Carter's sandflax	Linumcartericarteri	E
Elkhorn coral	Acropora palmata	T
Everglade snail kite	Rostrhamus sociabilis plumbeus	E
Florida Brickell bush	Brickelliamosieri	E
Florida leafwing	Anaea troglodyta floridalis	E
Johnson's seagrass	Halophila johnsonii	T
Staghorn coral	Acropora cervicornis	T

Traffic Inconvenience and Road Closures

Miami has long been the subject of limited transit options and traffic inconvenience, access to critical locations like Parks, Daycares, Schools, Libraries, Group homes, assisted living facilities, Major Grocery, Drug, and Box stores.

Critical locations are significantly impacted during the planning and construction phase of an F1 event. The residential attribute to most of Miami's landscape depends on these critical locations for their day to day livelihood. Other challenges during the construction phase (about three weeks) for residential communities will be access to emergency services and connecting to major roadways and highways; this could be managed with community engagement and strategic road detours during construction.

²² <https://www.floridamuseum.ufl.edu/southflorida/regions/everglades/endangered-species/>

Schools in proximity: The image below shows various schools in the areas surrounding the proposed race site.



Designated Critical locations: The image below shows various Parks, Daycares, School, Libraries, Group homes, assisted living facilities, Major Grocery, Drug and Box Stores in the areas surrounding the proposed race site.

