Scientific Research Publishing

Journal of Geoscience and Environment Protection, 2023, 11, 97-131
https://www.scirp.org/journal/gep
ISSN Online: 2327-4344
ISSN Print: 2327-4336

The Use and Abuse of Economics in Land Use Decision-Making in South Florida: An Industrial Park & Its Alternatives, 2020-2023

Richard Weisskoff

Department of International Studies, University of Miami, Coral Gables, FL, USA
Email: rweisskoff@miami.edu

How to cite this paper: Weisskoff, R. (2023). The Use and Abuse of Economics in Land Use Decision-Making in South Florida: An Industrial Park & Its Alternatives, 2020-2023. *Journal of Geoscience and Environment Protection, 11,* 97-131.
https://doi.org/10.4236/gep.2023.1112006

Received: August 25, 2023
Accepted: December 18, 2023
Published: December 21, 2023

Abstract

This paper reviews the economic methodology used to justify a proposed 357 hectare (800 acre) Industrial Park that would breach the Urban Development Boundary (UDB) in Miami-Dade County, Florida, a boundary that had been established to constrain urban sprawl and protect the surrounding wetlands and farmlands. We will examine the socio-economic setting of the region, the ownership of the farmland parcels designated to become industrial sites, and the misuse of the promoters' narrow economic analysis. Then we shall explain and compute correctly the likely job creation based on the author's own survey of recently constructed industrial plants similar to those proposed for this site. Rather than an industrial park, we offer instead a newly-designed multi-purpose Recreational–Ecological–Agricultural Park (REAP) & Nature Preserve which would maintain the integrity of the rural landscape, connect the densely-populated neighborhoods to the mangrove shoreline, and open nature's treasure chest to urban Miami and the wider public.

Keywords

Economic Analysis, Urban Development Boundary, Job Forecasting, Florida, IMPLAN

1. Introduction and Background

"Why have You breached its fences, So that all who pass by the way pluck its fruit?"—*Psalms* 80, v. 13.

The economic imperative has been the major driver in land use decisions during perhaps the entire "development" of Florida—from the initial "conquest" of nature, clearing the forests, draining the swamps, creating the networks of

railroads, roads, and canals, straightening the rivers, removing natural shoreline protection and then "renourishing" the eroding beaches, and now, finally, the "restoration" of the Everglades (Smith, 1984; Douglas, 1988; Derr, 1989; Grunwald, 2006).

The first fortunes were made by transferring and subdividing vast tracts of land, wrested or purchased from the native peoples, then used as incentives for the railroad promoters who retailed the lands to speculators and settlers for crops, pasture, and mining ventures. From 1890 on, once the frontier of the American west was closed, Florida became America's "last" frontier, with its unique climate and ecology (Tebeau, 1957; Dale, 2004, 2006).

Since the 1950s, land-use decisions in Florida have become more technical and locally based, even if guided by state–wide policies and community "master plans". Nevertheless, the classic battle lines remained from the conflicts of the earlier years: developers, land speculators, and urban expansionists, on the one hand, vs. environmentalists, naturalists, and preservationists, on the other. In the early rounds, lasting through the 1960s, the relentless quest for urban land as well as cropland, pasture, and mining rights, triumphed over the preservationists and naturalists for control of the ecosystems. Wet, dry, or rocky, all lands fell to the "built" world. However, Florida's local and state preserves, conservation lands, parks, and forests, and even the national parks, nature preserves, and marine sanctuaries, have all been dewatered or otherwise permanently altered by mining and unsustainable groundwater withdrawals (Bacchus, 1995, 2002, 2006).

In this second round, the once quaint frontier towns have grown into sprawling cities, and the once-green pastures outside the urban areas have been transformed into industrial zones, office parks, and massive tourist attractions. The theme parks, in turn, have created their own satellite hotel cities for the millions of visitors that have descended, seasonally, into what was left of this novel ecology.

In this process, the competition between the developer and the naturalist has become more intense and quantitative: "How many jobs will the new hotel or factory bring to our town?" "How many turtles will be destroyed by the new hotel on the beach?" "How much will the new development pay in impact fees?" "How much traffic, congestion, and noise will the new project create?"

In such cases, economy usually triumphs over nature: "My new factory will create 1000 new jobs on land that employs only 50 farmhands." "My new employees will be local; no need to travel far distances; less congestion on the roads." "My 800-acre industrial center will retain and return its rainfall to the aquifer. Your farms flood nutrients and runoff into the canals and pollute the Bay."

The priorities of the "built" system, seen as economic and social improvement, even with its vices of congestion and contamination, usually are shown to outshine the virtues of open space, resiliency, and sustainability. Once the eco-

nomic gains are shown to be positive, then Nature gets to be "mitigated", compromised, or simply bought out. If the economic side is shown to be in error, exaggerated, or even nonexistent, however, Nature may then get a fair hearing: the turtles, the rivers, lakes, beaches, and forests have a chance, and the laws that protect them can be enforced.

One further trap remains: Just as Nature may triumph over Economy, Politics may trump both Economy and Nature when "compromised" (i.e. "corrupted") public officials do the bidding of a few promoters or landowners and favor private over public interest. Mass mobilization, demonstrations, or public meetings may, at times, outweigh narrow private interests, but counter-demonstrations, subsidized by private donors, can also be manipulated to overwhelm scientific, rational, and environmentally-friendly solutions. The fights in the galleries, in public debate, and the courts are usually between well-paid lobbyists and *pro bono* naturalists (Dudley, 2004).

This researcher has found that **honest economic analysis and discovery can indeed neutralize the developer's promotional hyperbole, creating an "opening" thorough which scientific arguments, when examined fairly, can triumph.** I have participated in six land-use cases in which conventional economics proved crucial to commissioners and judges in their making balanced decisions in the best interests of both landowners and environmentalists. These were: the Miami Lake Belt Mining case; Sand Mining in Indian County; Cemetery Land-Use in Miami-Dade County; a new Regional Park for Central Broward County; Reach 8 Beach Renourishment in Palm Beach County; and Back-Pumping for Lake Okeechobee. I have also participated in four cases in which opposing political influences overrode clear economic and scientific evidence: FPL Powerlines in Miami-Dade; Limestone Mining in Hernando County; Phosphate Mining in Hardee County; and Gulf Hammock Limestone Mining in Levy County.

2. The Social Setting

2.1. South Dade Society, Towns, and People

In the southern edge of Miami-Dade County, 10 miles (16 km.) from its end, the 265-mile (426 km.). Florida Turnpike makes a striking, snake-like swerve inland before travelers reach the fabled and perplexing terminal intersection in Homestead. At this junction, the visitor faces three of Florida's "crown jewels". Turn to the right: Everglades National Park (1.5 million acres, 0.6 million ha.). To the left: Biscayne National Park (173,000 ac, 70,000 ha. mostly aquatic). Straight ahead: the Overseas Highway (113 mi., 182 km.) through the Florida Keys to Key West, the southernmost point of the United States.

In this area, from South Miami to Homestead, live 475,000 people, some of the poorest and richest in the county. The lower-tier towns, which run from Goulds to Florida City (See **Figure 1** and **Table 1**, lines 1 - 6), are smaller in population, faster growing, and poorer than the upper-tier region (**Table 2**, lines 7 - 16). Between 2010 and 2020, the population in the lower-tier grew by 50,000

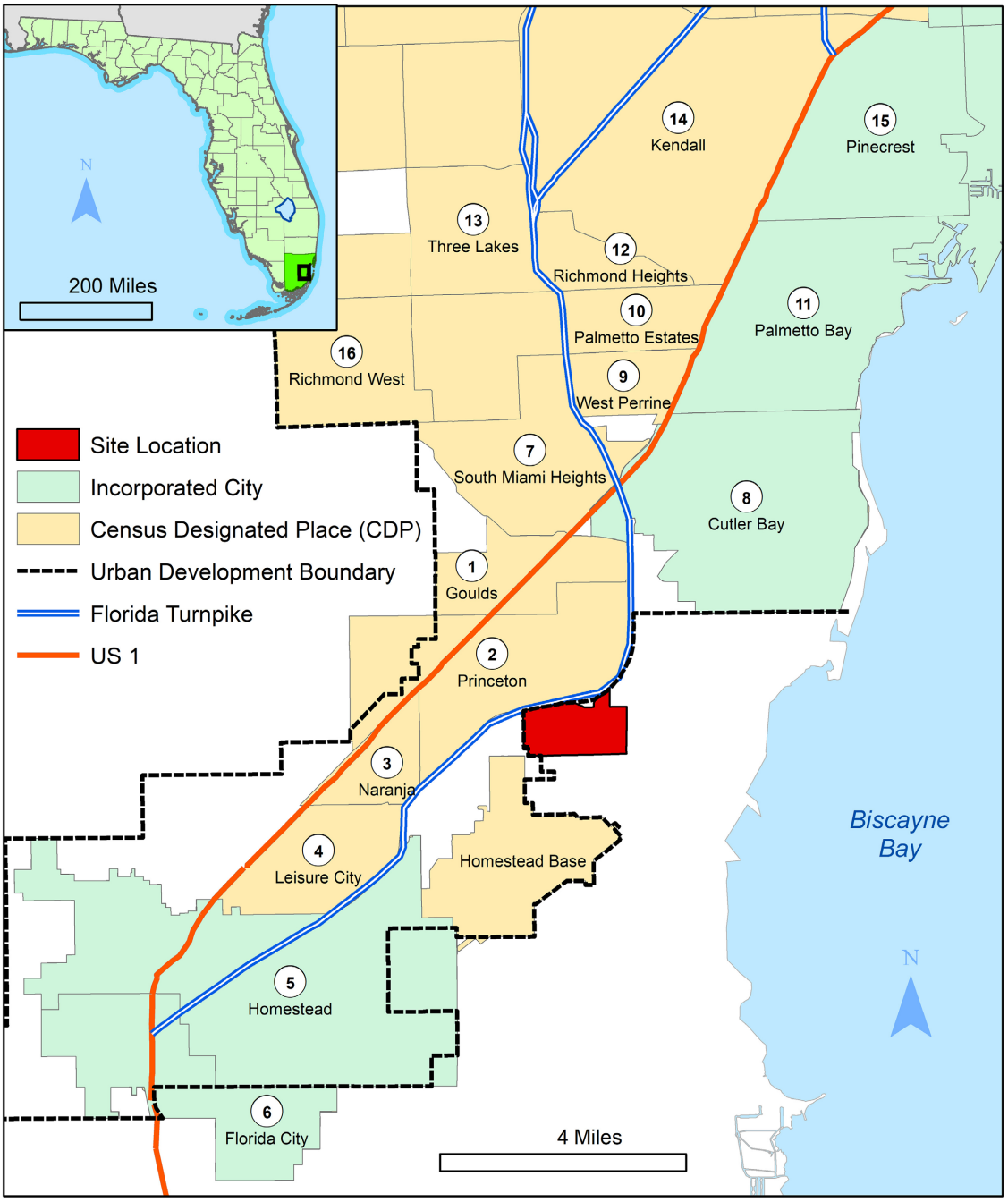

Figure 1. Site location of the project in South Miami-Dade County, Florida.

people (36.7%), compared to the increase of only 19,000 people (7.2%) in the upper-tier. The poverty rate in the lower-tier was twice that of the upper-tier (21.4% vs. 11.6%), and the per capita income of the lower-tier was half of that of the upper-tier ($18,609 vs. $35,265).

The comparison is even stronger between the two quintessential urban areas of Homestead (**Table 1**, line 5) in the lower-tier and Kendall (**Table 2**, line 14) in the upper-tier. Both areas reported almost identical populations of 80,000 in 2020. But Homestead had gained 20,000 and Kendall only 5000 from 2010 to

Table 1. Socio-economic profile of 6 southern-tier towns, South Miami-Dade County, 2020 census.

		1	2	3	4	5	6	7	8	9	10
	Area	Population		Pop. Change		Poverty Rate	$/Capita Income	Persons <18 yrs.	Median House Value	Persons per Household	Hispanic
		2010	2020	No.	%	%	$	%	$	No.	%
1	Goulds*	10,103	11,446	1343	13.3	23.5	17,347	23.6	263,800	3.32	48.9
2	Princeton*	22,038	39,308	17,270	78.4	10.8	22,827	26.5	279,300	3.64	67.3
3	Naranja*	8303	13,509	5206	62.7	27.6	14,420	35.7	211,400	3.63	60.7
4	Leisure City*	22,655	26,324	3669	16.2	23.5	15,361	28.1	214,300	3.79	84.2
5	Homestead**	60,512	80,737	20,225	33.4	23.0	19,404	33.2	235,800	3.53	65.3
6	Florida City**	11,245	13,085	1840	16.4	31.1	12,991	36.3	172,100	3.88	47.0
6a	**Sum:**	**134,856**	**184,409**	**49,553**	**36.7**						
6b	**Average (wt'd)**					**21.4**	**18,609**	**30.9**	**237,434**	**3.61**	**65.8**
6c	**County Total**	**2,496,000**	**2,702,000**	**206,000**	**8.3**	**15.0**	**29,598**	**20.2**	**310,700**	**2.95**	**69.1**
6d	**% Region in**										
	County (6a/6c)	**5.40**	**6.82**	**24.05**	**442.7**						
	or (6b − 6c)/6c					**42.7**	**−37.1**	**53.0**	**−23.6**	**22.4**	**−4.8**

Source: Computed from data given in U.S. Census Bureau (2021). Note: "Area-wide averages" (line 6b) weighted by 2020 population (col. 2) of each reported geographical unit. *Indicates CDP, Census Designated Place, i.e. not an incorporated place. **Indicates Incorporated City.

Table 2. Socio-economic profile of 10 upper-tier towns, South Miami-Dade County, 2020 census.

	Area	Population		Change in Population		Poverty Rate	Per Capita Income
		2010	2020	No.	%	%	$
7	So. Miami Heights*	35,696	36,770	1074	3.0	16.8	21,296
8	Cutler Bay**	40,286	45,425	5139	12.8	10.7	28,792
9	West Perrine*	9490	10,602	1112	11.7	22.3	16,857
10	Palmetto Estates*	13,535	13,498	−37	−0.3	8.6	21,549
11	Palmetto Bay**	23,410	24,439	1029	4.4	5.5	53,746
12	Richmond Heights*	8544	8944	400	4.7	8.5	26,649
13	Three Lakes*	15,047	16,540	1493	9.9	17.1	27,813
14	Kendall*	75,371	80,214	4843	6.4	10.7	39,009
15	Pinecrest**	18,223	18,388	165	0.9	8.7	87,841
16	Richmond West*	31,973	35,884	3911	12.2	11.0	26,055
17	Totals:	271,575	290,704	19,129	7.0	11.6	35,265

Source: See previous table. Poverty Rate & Per Capita Income for region are weighted by 2020 population. *Indicates CDP, Census Designated Place, i.e. not an incorporated place. **Indicates Incorporated City.

2020. Homestead's poverty rate was more than twice that of Kendall (23.0% vs. 10.7%) and the income level in Homestead was less than half that of Kendall

($19,000 vs. $39,000 per capita). Ethnically, the south tier is only slightly less Hispanic (66 versus 69%) (Table 1, cols. 5 - 10, lines 6a - c.).

2.2. The Urban Development Boundary (UDB) and Its Challengers

The urban development boundary (UDB), first drawn by county planners around Miami-Dade in 1965, has become one of those sticky, almost invisible, but alluring "lines" that developers have occasionally attempted to breach at great cost for their shot at great wealth. The process has always been hotly contested and legally intricate. The last major boundary breakthrough created the 295-ac. (119 ha.) Beacon Lakes Industrial Park in 2013 on *western* county wetlands, separated from the Everglades only by a prison and the county wellfields.

The current challenge to the UDB, which is where this study begins, is located on prime agricultural land near the *eastern* coast where the cross-county Princeton Canal flows into Biscayne Bay. Many natural factors are at work against the new proposal, but the rewards of transforming 800 low-cost agricultural acres into high-price industrial land will, as one farmer/banker testified, convert even the smallest landowner into a multi-millionaire (Hanks & Harris, 2022b; CBRE Inc., 2022)! The Beacon Lakes Industrial Park boundary breach took four years to accomplish; the current case is now in its second year and the outcome is still uncertain.

The purpose of the county's UDB is to "restrain and contain" the city's sprawl, protect the delicate environmental surroundings—the Everglades swamps to the west and Biscayne Bay to the east—and also the traditional farmlands that remain outside the boundary (perhaps reminiscent of the Biblical prescription to leave the land open around the cities of the priestly Levite tribe:

> "…Give unto the Levites…cities in which to dwell; and an open area round about them…They shall dwell in the cities, and their surrounding (undeveloped) belts should be for their livestock, and for their goods and for all amenities of their lives." *Numbers*, Ch. 35, v. 2-3.

In March 2021, a consortium of developers announced a spectacular plan to bring 40,000 jobs to South Dade, already the fastest growing part of the county. They argued that workers there faced extremely long commutes to the center and north parts of the county. Their proposed 800-acre (357-ha.) South Dade Logistical and Technological District (SDLTD) would create 13,000 construction jobs immediately and eventually 27,000 permanent jobs once the facilities began operating. These local, well-paying jobs were simply waiting for the Board of County Commission (BOCC) to change the zoning and extend UDB boundary. (See https://bringthejobssouthdade.com/, Bring the Jobs South Dade, 2021).

A local economic consultant produced the employment projections that became the mantra for the Project as the 40,000 job "game changer" for South Dade (Bercow Radell Fernandez Larkin & Tapanes, 2021; Miller, 2021; South Florida Commercial Real Estate News, 2021). The Miami-Dade Economics (RER) staff argued that there was sufficient industrial space elsewhere within the existing

boundaries of the UDB. The applicants argued that their unique South Dade space was the only available parcel large enough for their full 800 ac. (357 ha.) as a single project; it could not be replicated elsewhere See ((Dade County Government (MDG) 2021)) for official documents; see (Bryant, 2021) for comparisons.

No one asked, "What is a logistical center? What is a technological district? Do our local workers qualify for this? What is the experience of the FedEx and Amazon facilities located within a few blocks of the proposed district?" (Morales, 2020; South Dade News Leader, 2020; Business Wire, 2021)

In August 2021, the developers lowered the job estimates from 40,000 to 30,000, still a respectable number. The project was to be done in three "phases", referring not to sequencing of construction, but rather to the grouping of the 37 parcels that composed the project ((Dolkart, 2021a) for the earlier and (Dolkart, 2021b) for the revised estimates).

By September 2021, the county and state agencies started reporting their final findings on the project. The county staff of the Miami-Dade Department of Regulatory and Economic Resources (RER), the Florida Department of Environmental Protection (FDEP), Florida Department of Agriculture and Consumer Services (FDACS), the Florida Office of Resiliency (FOR), South Florida Water Management District (SFWMD) (Glenn, 2021), Florida Department of Economic Opportunity (DEO), all opposed the project for technical reasons (LePradd, 2021). Nevertheless, on September 9 the Board of County Commissioners (BOCC) voted to transmit the project to the state without recommendation, discounting or ignoring its own staff's recommendations. (See comments from Tropical Audubon Society by (Ferreira-Miani, 2021)).

By November 2021, Laura Reynolds, founder and director of "Hold the Line Coalition", organized a group of outside scientists and engineers to give the BOCC an independent opinion on the technical issues that had become politicized in the conflict between the mayor and her staff, on the one hand, and the developers, on the other.

The job forecasts were the major justification for the project, yet the prominent professional group composed of two hydrologists, a biologist, agronomist, city planner, and water modeler—lacked an economist! I was asked to provide the economic analysis, the results of which are presented in this paper (Hold the Line Coalition, 2022).

By December 2021, the first draft of the critique of the project was ready for the BOCC's final decision, but the commission deferred its vote until March 19, 2022, and then again until May 15, 2022. In this final showdown BOCC meeting, filled with overflowing crowds and a dramatic intervention by the dissident banker/farmer Leonard Abess. One county commissioner, who had been present 10 years earlier at the Beacon Lakes expansion of the UDB, remarked that in all her years as commissioner, she had never heard such testimony, such a challenge! Nevertheless, the Commission deferred again, and no final vote was taken (Editorial Board, 2022a, 2022b).

In June 2022, the BOCC see met again and deferred the vote until August 2022, by which time the developers, facing solid opposition, had reduced the size of the original 793-ac. (321 ha.) project by 53% to 379 ac. (169 ha.), as shown in Table 3. However, the total number of jobs was reduced by only 34%, lowering their original forecast of 13,000 construction workers to 9000 and the number of permanent workers from 17,000 to 11,000. The new total job forecast was now 20,000, still a "game-changer" for South Dade (Editorial Board, 2022b; Fried, 2022; Miami-Dade Board of County Commissioners, 2022; Reynolds, 2022).

The BOCC at their September meeting, again deferred until November 15, as a final deal was being negotiated in which the developers would "gift" the county 3 ac. (1.2 ha.) from a selected land file for each acre (0.4 ha.) of their proposed industrial site. That compromise passed by a single vote. The mayor vetoed the legislation on November 22 (Levine Cava, 2022). The Commission met hastily five days later to override the veto and the will of the very commissioner in whose district the project was to be located (Hanks, 2021a, 2021b, 2021c, 2022a, 2022b, 2022c, 2022d; Hanks & Harris, 2022a, 2022b; Harris, 2022).

It looked like the issue was settled. The saga took from March 2021 to November 2022, one and a half years to breach the boundary.

In January 2023, the Florida Department of Economic Opportunity (DEO) announced that all the proceedings narrated above had exceeded the original time limit of 180 days that Florida law allowed for the applicant's "emergency proposal". The entire procedure was invalidated and would have to be rerun

Table 3. Introduction to the two projects.

Category		Project 1 (Sunfish 1)	Project 2 (Sunfish 2)	% Change
1	Gross size (acres)	793	379	52.2
	(hectares)	321	153	
2	Assigned for development			
	(thou. sq.ft.)	9425.0	5997.0	36.4
	(thou. sq. m.)	875.6	557.1	
3	Construction costs ($ mill.)	931.2	609.6	34.5
4	Jobs			
	a. Permanent	17,446	11,016	36.9
	b. Construction	13,423	9334	30.5
	c. Total	30,869	20,350	34.1
5	Market value ($ mill. 2023)	74.6	41.6	−44.2

Sources: lines 1 - 4: Bercow Radell Fernandez Larkin & Tapanes (2021). line 5: Computed from Miami-Dade County Property Appraiser (2022). See **Table 5**, **Table 6** below.

under the new county commission that had just been elected the previous November (Hanks & Harris, 2023).

The developers, with some irony, now joined with the legal section of the County, to challenge the DEO ruling in court. The developers were also supported by two lawmakers who introduced legislation to change the DEO rules to retroactively extend the old deadlines, thereby overriding the DEO invalidation of their case (Klas, 2023).

On June 16, 2023, a local Homestead resident, backed by Hold the Line Coalition (2023) and the Everglades Law Center, joined the DEO and the State of Florida by filing a complaint against the developers as a landholder whose property would be injured by the proposed project. The objections filed by the County and the developers against this intervenor were dismissed by a Florida Circuit Court on August 15, 2023, allowing the intervenor, Dr. Nita Lewis, to participate in the forthcoming legal hearings.

To better understand the beneficiaries of this project, we now turn to an examination of the 37 underlying parcels that comprise the project, their ownership and value.

3. Parcels of the Project: Size, Ownership, and Value in Sunfish 1 & 2

The SDLTD proposal will be analyzed in its two incarnations (1) the original 800-ac. (234 ha.) proposal of July 2021, which we shall nickname, "Sunfish 1" due to its terrestrial silhouette, and (2) "Sunfish 2", the stripped down 380 ac. (159 ha.) version approved by the BOCC in August 2022, but currently disputed by the State of Florida.

Sunfish 1, as shown in **Figure 2**, is actually a leviathan-size consortium of 37 parcels but owned by nine different entities or individuals, listed by their project and phase, in **Table 4**. The entire block of properties gives the appearance of being connected as a single, contiguous tract, but the "Phases" in the proposal reveal a more confusing and contentious agenda.

Figure 3 gives the location of Phase 1 parcels which "fix" the lower southeast border and Phase 2 "fixes" the upper and western borders. But almost half of the entire project's acreage is composed of 21 other parcels with eight different owners. These "fill in" the hollow belly of the fish which itself is bifurcated by the Princeton Canal. While developers specified plans for Phases 1and 2, Phase 3 was left unstructured. Sunfish 1, in short, has a partial front and cap, a big bottom and rump, but no guts.

While Phase 3 has the most land, 385 ac., 172 ha., and therefore shows the greatest value, $42.2 million in 2023, it is Phase 2 with 141 ac. (57 ha.), valued at $18.4 million that has experienced the most growth in value (285% compared to the 251% in Phase 3 and 150% in Phase 1.

The 2022 compressed Project, Sunfish 2 (Figure 4) eliminated the 15 westernmost parcels out of Sunfish 1, leaving 22 parcels with their original 10 owners. The distribution of ownership is similar to Sunfish 1 but scaled down: The

Figure 2. Mosaic of parcels in Sunfish 1, South Miami-Dade, 2023.

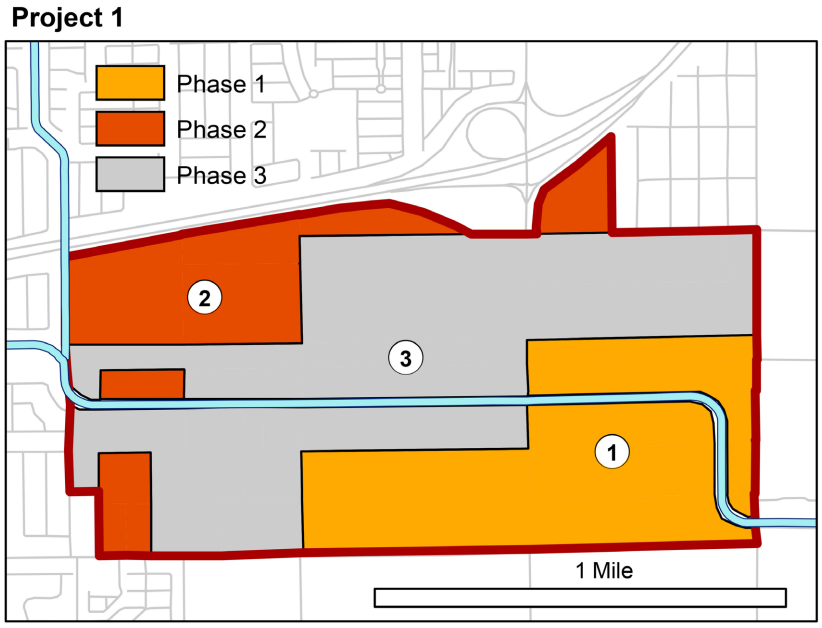

Figure 3. Sunfish 1, 800-acre industrial park, 2021.

Table 4. Guide & legend to Sunfish 1 & Sunfish 2. Their phases & owners.

Code	Parcel owner	Sunfish 1 Phase:			Sunfish 2 Phase:		
		1	2	3	1	2	3
A	DAD land holding		2			2	
B	DAD land holding		2			2	
C	DAD land holding		2			2	
D	DAD land holding		2			2	
E	FPL			3	1		
F	Bedrock S. Dade		2			2	
I	Archimedes xxxiv			3			
J	Archimedes xxxiv			3		*	
K	Archimedes xxxiv			3			
L	FPL			3			3
M	FPL			3		*	
N	FPL			3			
O	Barry Brant			3			3
P	Barry Brant		2			2	
Q	Jose Luis Martinez			3			3
R	FPL			3		*	
S	Archimedes xxix			3			
T	M&R Tower			3			3
U	Barry Brant			3			3
V	EPC SW 261, Hmstd.			3			3
W	EPC SW 261, Hmstd.			3			3
X	Barry Brant			3			3
Y	Archimedes xxix			3		*	
Z	Pedro Robau	1				*	
a	PanAm Fed Cred Un.			3			3
c	Buxeda Holdings		2			2	
d	Buxeda Holdings		2			2	
e	Buxeda Holdings		2			2	
f	Archimedes xxi			3			3
g	117 SW 268 St LLC			3			3
h	117 SW 268 St LLC			3			3
i	Pedro Robau	1					
j	Pedro Robau	1					
k	Pedro Robau	1				*	
l	Pedro Robau	1					
m	Pedro Robau	1					
n	Pedro Robau	1					
	Total # parcels	**7**	**9**	**21**	**1**	**9**	**12**
	Grand total			**37**			**22**

Legend: Phase 1; Phase 2; Phase 3; Deleted. Note: * Indicates parcels excluded from Sunfish 2. Source: Computed from Miami-Dade County Property Appraiser (2022). See **Table 5**, **Table 6** below.

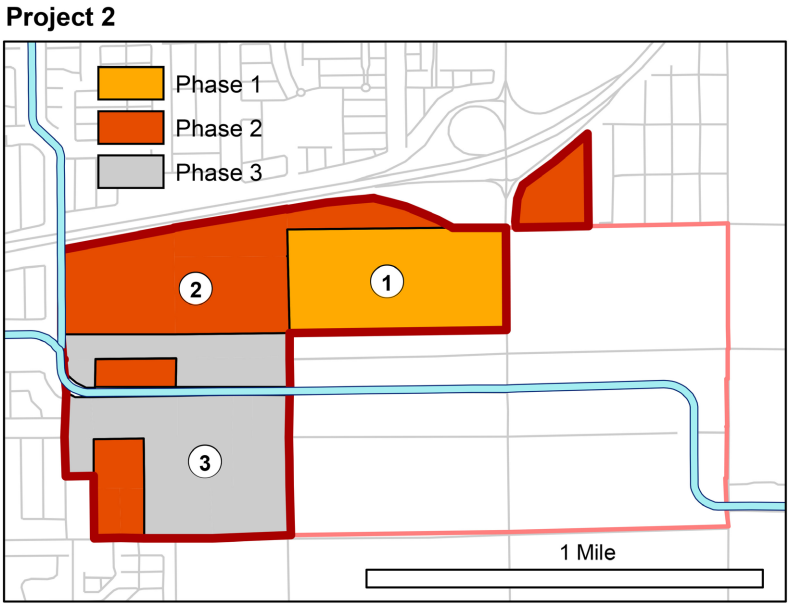

Figure 4. Sunfish 2: 380-acre industrial park, 2022.

new Phase 1 features only one large parcel owned by Florida Power & Light (the electric utility); Phase 2 has the identical four owners of nine parcels as in Sunfish 1; Phase 3 has been reduced from 21 to 12 parcels but with the same eight owners, as shown in cols. 1 & 2 in Table 5 and Table 6. In Sunfish 2, the Phase 3 parcels experienced the greatest rise in market value from 2019 to 2023, as shown in Table 6, col. 16, compared to the Phases 1 and 2 parcel-groups. However, this might be due to their low initial values in 2019 (cols. 9 & 15), as well as the anticipation of being rezoned as industrial land.

4. The Economic Tools

4.1. Properly Used

The economic model for forecasting employment holds the key to evaluating the apparent conflict presented between "jobs" and "nature". The developers may be able to estimate their land and construction costs accurately and even their expected profits, but true employment will not be known until the facility is built, the latest technology installed, and recruitment begins. To win the support of the local authorities that issue the land use permits, financial incentives, and tax exemptions, it behooves the promoters showcase the greatest possible number of jobs and the prosperity their proposal will bring to the region. Job comparisons, once computed, are thought to be a "no brainer" when development jobs are compared to jobs created by nature, agriculture, or even "open-spaces", as the last mentioned is thought to employ almost "nobody", and even farmland is seen as creating only a few fulltime jobs plus a mass of seasonal, non-voting migrant farmworkers.

Public and private agencies use one of several modeling tools to measure economic impacts. These models are detailed, flexible, interactive, and realistic; they

Table 5. Summary of parcels, Sunfish 1, by phases, 2019-2023.

	1	2	3		4	5	6	7	8	9	10	11	12	13		14	15	16	17	18
	Owners	Parcels	Lot size		Market Price (thou. $)					% Change in Market Price from:				Ac.	Ha.	Thou$/ac.		Thou$/ha.		Change
	#	#	thou. sf	thou. m²	2023	2022	2021	2020	2019	2022-'23	2021-'22	2020-'21	2019-'20			2023	2019	2023	2019	%
Phase 1	1	7	7431	690	14,057	10,792	9449	5626	5626	30.3	14.2	68.0	0	163.6	66.2	86	34	212	85	149.9
Phase 2	4	9	6122	569	18,402	14,158	7806	4785	4785	30.0	81.4	63.1	0	141.0	57.1	131	34	322	84	284.6
Phase 3	8	21	17,541	1630	42,186	29,287	19,488	12,038	12,023	44.0	50.3	61.9	0.1	385.0	155.8	110	31	271	77	250.9
Totals	**13**	**37**	**31,094**	2889	**74,645**	**54,237**	**36,743**	**22,449**	**22,434**	**37.6**	**47.6**	**63.7**	**0.1**	**689.6**	**279.1**	**108**	**33**	**267**	**80**	**232.7**
	(10*)																			

Note: *Duplicate owner in Phases 2 & 3. Source: Computed from parcel files, Miami-Dade County Property Appraiser (2022).

Table 6. Summary of parcels, Sunfish 2, by phases, 2019-2023.

	1	2	3		4	5	6	7	8	9	10	11	12	13		14	15	16	17	18
	Owners	Parcels	lot size		Market Price (thou. $) in Year:					% Change Market Price from:				Ac.	Ha.	Thou$/ac.		Thou$/ha.		Change
	#	#	thou. sf	thou. m²	2023	2022	2021	2020	2019	2022-'23	2021-'22	2020-'21	2019-'20			2023	2019	2023	2019	%
Phase 1:	1	1	3394	315	4639	4639	4639	2787	2787	0	0	66.5	0	60.0	24.3	77	46	191	115	66.5
Phase 2:	4	9	6122	569	18,403	14,169	7806	4785	4785	29.9	81.5	63.1	0	140.6	56.9	131	34	323	84	284.6
Phase 3:	8	12	5863	545	18,570	12,286	6415	4050	4048	51.1	91.5	58.4	0	134.1	54.3	138	30	342	75	358.7
Totals	**13**	**22**	**15,379**	1,429	**41,612**	**31,094**	**18,860**	**11,622**	**11,620**	**33.8**	**64.9**	**62.3**	**0**	**334.7**	135.5	**124**	**56**	307	86	**120.6**
	(10*)																			

Notes: *indicates number of new, unrepeated owners. Source: Computed from parcel files Miami-Dade County Property Appraiser (2022).

are created on current databases together with ready-to-go, off-the-shelf software, and compute impacts for individual counties and groups of counties ((Carlson et al., 1995) for the classic study on the upper Mississippi river system; (Weisskoff & Ruiz, 1994) on Puerto Rico; (Weisskoff, 1998, 2000) on Everglades restoration; (Weisskoff et al., 2020) for a retrospective evaluation of the forecasts).

The U. S. Department of Commerce, Bureau of Economic Analysis began in the early 1970s to compute regional economic models with RIMS (Regional Input-Output Modeling System) for any county or combination of counties in the U.S. for very modest fees. In 1976, the Forest Service of the U.S. Department of Agriculture began to develop its own flexible, hands-on input-output system, called "Impact Analysis for Planning" (IMPLAN) which in 1987 was shifted to the University of Minnesota. In 1993 it was transformed into a private company, Minnesota Implan Group, Inc. also known as MIG Inc. Their innovation was to allow users to "construct and configure" their own regional model at the county level and later, at the ZIP Code level.

The IMPLAN system is based on a complete "social accounting matrix" (SAM) that extends the input-output accounts to another 21 economic and demographic variables, and it is from the SAM that the economic impacts are computed (Minnesota IMPLAN Group Inc., 1999).

MIG had opened for business on Nov. 25, 1992, but was dissolved on Oct. 29, 2010. Its name and files were sold to a new group registered on Feb. 21, 2013, headquartered in Huntersville, NC, renamed simply, IMPLAN Group LLC. See Minnesota Secretary of State (2023) and North Carolina Secretary of State (2023).

The tool selected by the South Miami Dade applicant in 2021 is documented as "Minnesota IMPLAN".

A third and by far the most expensive modeling system is REMI (Regional Economic Models, Inc). The REMI modeling system takes the IMPLAN-type setting, expands it to include hundreds of economic and demographic relationships for 30 years into the future. The user can alter the time profile of any of the variables during that projected time horizon. REMI is said to be a "dynamic" model, while both RIMS and IMPLAN are "static" models, compressing all economic activity into a single year. Thus, REMI can be used to introduce new technologies, build a project in periodic stages, and anticipate bottlenecks in the future, if these data are known for the project. In Florida, the state and many of the regional and county planning agencies use REMI routinely to evaluate large and complicated projects. See Weisskoff (2003, 2005), Ch. 11-12, which hybridizes the detail of IMPLAN with the flexibility of REMI.

The fatal defect in all these economic models is their lack of "ecological consciousness". The models forecast economic and job growth, but will there be enough land, water, and air to support all this activity, the new workers and their families? One current practice, therefore, is to "attach" requirements for space, air, and water to these models, to gauge the economic impacts of the economy on ecology, or to build the cost of corrective practices into the input-output structure itself (Potravny, Gusev, Stoykov & Gassiy, 2017).

Since the proposed project used Minnesota IMPLAN to forecast jobs, we too shall use the latest 2020 IMPLAN model and data for Miami Dade County to replicate and verify the forecasts done by the South Dade Logistical District applicants for this project.

The economic model computes three types of employment impacts (direct, indirect, and induced) for two categories of jobs (a) temporary, short-term, non-recurring (i.e. construction) jobs; and (b) permanent, long-term, recurring (i.e. warehouse) jobs that will go on for many years.

"Direct economic impacts" refers to the jobs that are immediately needed, for example, electricians and laborers during the construction phase, and machine operators and office workers in traditional warehousing, once the facility is built.

"Indirect job impacts" refer to jobs needed for making the material and service inputs that are needed by the "direct" workers, for example, workers needed to make the cement and cut the lumber for the construction site and the workers needed to produce the cardboard boxes and service the forklifts for the warehouses.

The third level of job creation, called "induced job impacts", is the number of jobs needed to produce the goods and services that are consumed by the new di-

rect and indirect workers that are employed as a result of the project.

These three measures of job impacts (direct (D), indirect (I), and induced (C)) and their sum (DII), reflect the degree of integration of the local economy, in which the work force produces the raw materials, manufactures and processes these materials, and then consumes their locally-made goods. Such an economy may exhibit a strong "ripple" or multiplier effect when a new activity is introduced. If, on the other hand, there are few *linkages* among the producing sectors, or if the outputs are exported and the consumer goods imported from elsewhere, then the domestic multiplier will be short-circuited and the impacts or "ripples" will be minimal. "Short-circuiting" creates the "perfect enclave", an open economy with many *leakages* compared to the "well-integrated economy", which has developed strong and complex linkages among local sectors. (The mathematics of the model is laid out in (Weisskoff, 2000) and (Weisskoff et al., 2020))

4.2. The Tools Abused

How valid were the job estimates used to justify the SDLTD? Were the economic tools used or misused? What other economic factors, called "externalities", were neglected because they occur outside the project boundaries, but they are actually "internal" to and caused by the very project, for example, existing farm jobs displaced by the project, harm done to the surrounding residential neighborhoods, increase traffic congestion, and increased risk to thousands of homes due to potential flooding and hurricane surge when the protective marginal lands are converted into concrete platforms for the industrial park.

In this section I shall describe the errors and misrepresentations in the applicant's procedures and results and how I correct them. My original analysis was developed in December 2021 on the basis of Sunfish 1, which was then supplanted by Sunfish 2 in August 2022. The applicant used the same methodology in both projects, so my critique applies to both sets of their job estimates. Although only the Sunfish 2 results are "still on the table", both sets of computations illustrate the magnitude of the original errors, introduced in Sunfish 1 and left uncorrected in Sunfish 2. The exaggeration of job creation built into and emerging from the applicant's economic modeling deliberately raised and then maintained the expectation of high job creation when, as we shall see, the new jobs would be minimal, the choice of industry inappropriate for the region, and the timing of the construction of the project greatly misrepresented.

First, the promoters assume that all the 7000 D and I construction jobs would occur in a single year, yet there is a mention of a 3-year build-out in their Storm Water Management Master Plan in Langan Inc. (2021). Finally in May 2022 the developers published an editorial recognizing that a project of this size might indeed take 10 to 15 years to complete, implying that the thousands of construction jobs estimated by the applicant should be divided by a factor of 10 to 15 (Hevia & Blumenthal, 2022). This would reduce the annual jobs from 7000 to 700 or 467, respectively.

This error was first reported by the South Florida Regional Planning Council (2021). Clouse (2019) in her article posted on the IMPLAN.org website also explicitly cautions users to deflate "total construction jobs" by the number of "years to complete" since the IMPLAN model compresses a multi-year project into a single year. The applicants counted one electrician working for 10 years as "10 jobs".

Since Phases 1 and 2 are described in detail as the only segments likely to be built, then the number of total jobs that can be expected might even be lower, even half, of what remains after correction is made for "space per worker". A further reduction might be expected over time due to the high rate of growth in the logistics industry, forecast to continue at 14% per year for the next ten years (Hunter, 2021; Research and Markets, 2021, 2023).

5. Forecasting Jobs

5.1. Basic Parameters

We turn now to the application of the important but little studied employment model that the applicant used to win the support of county politicians and the voters. The financial rewards of the project are clear to the promoters: the increase in value of the rezoned land. But how was this to be "sold" to the voters? In the case of a residential project, the social benefits are identifiable simply as "new homes", but in the case of industrial facilities, it is the "new employment" that takes center stage.

The procedures that the promoters used to estimate new jobs is very straightforward and conventional. They began with (a) dimensions of the project's land size; (b) a set of industry-specific ratios relating "the physical space required for each worker" and (c) one off-the-shelf regional input-output model, named as "Minnesota IMPLAN" which, they claim, computes the direct, indirect and induced jobs for each project. The procedure followed for Sunfish 1 was simply scaled down for Sunfish 2. The basic measurements are laid out in **Table 7**.

Table 7. Comparing the basic parmeters: space per worker of the applicants & this study.

		Applicant*		Applicant		This Study		
		# wkrs/thou.		sq. ft.	m^2	sq. ft.		m^2
		sq. ft.	m^2	per worker		per worker		
		1	2	3	4	5		6
1	Basic warehousing	0.75	8.1	1333	124	3272	**	304
2	Last-mile warehousing	1.50	16.1	667	62	1636	***	152
3	Office/commercial fast food, gas station, shops, bank.	# given: (Phase 1: (Phase 3:		67) 253)		300	****	28
4	Hotel: wkr. /key			0.35		0.22	*****	

Sources: *from Dolkart (2021a, 2021b). **Survey of Fl. & other US studies; see below **Table 10**. ***half of survey number. ****Mehigan (2016), Kolmar (2021). *****hotel survey.

The applicant provided the square footage (sf, m^2) of the project and the costs of construction for Phases 1, 2, and 3 of the project. The key parameters—space per worker—were calculated for warehousing, while jobs in office, hotel, and commercial facilities were provided as totals.

These "worker to space" ratios, based on industry surveys, change over time depending on innovation and labor-saving automation. When machines or robots "displace" workers in warehousing, for example, spreading a smaller work force over the same or larger space, then the ratio, jobs/sf or jobs/m^2 may increase, for example, from 1 worker per 2000 sf (or 1 wkr./186m^2) to 1 worker per 3000 sf (or 1 wkr./279m^2). The newest 3 million sf (278,700 m^2) factory, now using robots, needs only 1000 workers, not the initial 1500 expected earlier. A similar effect has been occurring with regard to office space as computerization, flexi-space, and work done remotely reduces the space needed at headquarters.

The above jobs-to-space ratio is sufficient for estimating only the direct jobs to be hired in the first round. However, the indirect effects require further explanation.

There are two approaches to compute the indirect and induced multiplier effects. The first is a simple input-output model, like IMPLAN, whose methodology is well established and widely used by government and private enterprises. However, the Miami-Dade County economics staff used the high-powered REMI model (Regional Economic Modeling Inc.) for estimating jobs and other effects of the proposal on the county economy. This included such factors as new taxes, population growth, migration, changes in wages, and innovation.

For the "construction" activity of the projects, the applicant provided the dollar value of investment, from which the IMPLAN model computes direct, indirect, and induced jobs. For "warehousing" operations, however, the applicants provided only the space (sf or m^2) of the workspace. Hence, the ratio of *workers per square foot* (or per m^2) must be applied. Once the total number of direct jobs is estimated, then the number of indirect and induced jobs can be computed by the input-output model, either IMPLAN or REMI.

The applicants specify one job for each 1333 sf (123.9 m^2) but the literature from 2010-2020 suggests that warehousing space required for each worker was already known to be much higher. (See **Table 8**, lines 1 - 7.) The results of my survey of 10 recently constructed projects in Florida and other states (**Table 9** & **Table 10**) showed that the average worker is associated with 3226 sf (300 m^2). This reduces the number of jobs to a third of the applicant's number and also the number of indirect and induced jobs.

There are five other shortcomings of the applicant's calculations which could be overlooked as "professional differences", but since the errors are so egregious and all work to overstate the expected number of jobs, they demand further scrutiny.

First, since construction activity usually takes several years to build-out, the entire 800-acre (324 ha.) project should be divided by 10 or 15 years for full completion, as mentioned above.

Table 8. Comparing the basic parmeters: space per worker, historical antecedents.

		Warehousing		Office		Commercial		Hotel	Sources
		sq. ft.	m^2/wkr	sq. ft.	m^2	sq. ft.	m^2	wkrs.	
		per worker		per worker		per worker		per key	
1	Buildable Land Report 2007	1000	93	300	27.87	600	55.74		Snohomish County, WA (2007).
	av:	500	46			700	65.0		
2	Fishkind Assoc. 2008 av:	5000	465	350	32.52	600	55.74	0.5	Plans (2009) cites Fishkind & Associates (n.d.) and South Florida Regional Planning Council (2007).
	range:	1000	93						
	range:			275	25.55	450	41.81		
	range:	7500	697	450	41.81	650	60.39	(0.5 - 1.0)	
3	Ft. Collins study 2009	2000	186	300	27.87	500	46.45		URS (2009).
4	Saint Paul, MN 2016	-		600	55.74	920	85.47		Saint Paul Metropolitan Council (2016).
5	Dept Energy Survey 2017	2222	206						U.S. Energy Information Administration (2022).
6	Hotel surveys							0.22	See **Table 9** below.
	range:							(0.17 - 0.26)	
7	Average (lines 1 - 6)	2556	237	388	36	655	60.85		
	Compare to:								
8	Applicant Profile	1333	124	250	23.23	n.g	n.g.	0.35	**Table 7** above.
9	This study	3272	304	300	27.87	300	27.87	0.22	**Table 7** above.

Table 9. Summaries of recently constructed logistics plants and hotels, 2019-2021.

		sf/worker	m^2/wkr	# rooms	# employees	Jobs/room
	Logistics plants:					
1	Survey, 4 Florida plants (from **Table 10**)	3300	307			
2	Survey, 6 USA Plants	3150	293			
3	Average, 10 Florida & US Plants	3226	300			
	Hotel Jobs & Rooms					
4	Andrade study (Andrade, 2018)			150	25 - 39	0.17 - 0.26
5	Economy hotel			50		0.33
	(Depends on food services, sales, staff)					

Sources: Lines 1 - 2 from **Table 10** below.

Table 10. Computing space per worker, Florida and other USA Studies.

	Location of project	Publication date	sq. ft. (thou.)	sq. m. (thou.)	# Jobs Promised	sq. ft. per job	sq. m. per job	Owner	Source
1	Naranja, Project Flash, SoDade	July 13, 2020	1012.2	94.0	325	3115	289	Amazon	PROFILE Miami (2020).
2	Coral Springs (Delivery Station)	Aug. 11, 2021	250.0	23.2	200	1250	116	Amazon	Deutsche (2021).
3	Pembroke Park	Dec. 20, 2021	200.0	18.6	60	3333	310	Amazon	Anwer (2021).

Continued

4	Port St. Lucie	Dec. 7, 2020	245.0	22.8	40	6125	569	FedEx	McKelvey (2020, 2021)
	Total (or unweighted average*) Fl. (lines 1 - 4):		1707.3	158.6	625	3456	254*	w/FedEx	
	Average weighted by plant size:					3300	307		
5	Philadelphia, Pa.	Feb.10, 2020	1,000,000	92,903	352	2841	264	UPS	De Stefano (2020).
6	Stafford, Va.	Nov. 9, 2021	630,000	58,529	500	1260	117	Amazon	Sidersky (2021).
7	Mid-Michigan: Delta Charter	Sept. 8, 2021	1,000,000	92,903	500	2000	186	Amazon	WILX News.10 (2021) Kasba (2021).
8	W. Michigan, Huron charter	Sept. 23, 2021	750,000	69,677	100	7500	697	Amazon	WXYZ Detroit (2021).
9	Montgomery, Ala.	Feb. 2, 2022	650,000	60,387	500	1300	121	Amazon	Montgomery City, AL (2022)
10	Huntsville, Ala.	Nov. 9, 2021	1,000,000	92,903	250	4000	372	Amazon	Amazon Press Center (2021)
	Total (or unweighted aver.*) other USA (lines 5 - 10):		5030.0	467.3	2202	2700*	251*		
	Average weighted by plant size:					3150	293		(includes bulk carriers)
	All 10 plants simple average (lines 1 - 10):					3272	304		
	All 10 plants weighted average (lines 1 - 10):					3226	300		

Second, "construction" (Table 11) usually consists of at least three different activities 1) water, sewer, utilities (sector 56 in the IMPLAN scheme); 2) roads and related preparation (sector 54); 3) new manufacturing structures (sector 51). Each of these activities has different job and investment characteristics which must be modeled into the proposal. The applicant's proposal provides no information on the three construction sub-sectors or their sequencing, but merely compresses all of construction into a single sector for a single year.

Table 11. Breakdown of construction costs.

	Category	IMPLAN Sector #	Suggested Distribution**	Estimating Hard Costs***
		#	%	($mill.)
1	Water, Sewer	56	15	139.7
2	Streets & Highways	54	8	74.5
3	New Manufacturing plant	51	77	717.0
	Total:		100	931.2*

Sources: *Total costs from Dolkart (2021a), were distributed according to Clouse (2019)** to estimate sub-category hard costs***.

Third, since "direct jobs" are generated on the project site, these employees will probably be located in or around that project district, but the indirect and induced jobs could be located anywhere in the county and may not be available for local workers. Therefore, our attention should be focused, first, on the direct jobs, and lesser so on the indirect and induced (DII) ripple effects or total jobs if we are truly concerned about the jobs likely to become available for South Dade.

Fourth, the economic study for the applicant cites "Minnesota IMPLAN", a

company which was dissolved in 2010. There is no mention of a specific year of the database or the county for which the model was built.

In this paper, I have replicated the applicant's project with properly-leased 2021 IMPLAN model and data for Miami-Dade County.

Fifth, the key number in this whole exercise is the "space per worker" coefficient and its changes as robots, drones, conveyor belts, and the newest "sparrows" do the picking, sorting, packaging and shipping. The applicant gives 1 worker per 1333 sf (124 m^2) for basic warehousing and 667 sf (62 m^2) for last-mile warehousing, compared to my survey numbers of 1 worker per 3272 sf (304 m^2), and 1 worker per 1636 sf (152 m^2) for basic and last-mile warehousing, respectively (see **Table 7**). The applicant does not specify "space per worker" for office and commercial but rather specifies only the number of jobs in the fast-food store, gas station, shops, and the drive-through bank. The applicant estimates 0.35 workers per hotel room, whereas my survey of current economy hotels suggests 0.20 workers per room.

My estimates of space per worker are presented in **Table 8**. The four historical surveys from 2007 to 2017 (lines 1 - 3) average 2556 sf (237 m^2) per worker. The U.S. Energy Information Administration (2022) of the Department of Energy (DOE) in its data for 2017, the latest year available, reports 2222 sf/wkr (206 m^2) which is the parameter used by the Miami-Dade County staff economists. Their parameter is almost twice the 1333 sf (124 m^2) used by the applicants. Nevertheless, the DOE parameter is probably an underestimate as it is weighted by the full range of older and newer facilities nationwide. We should be interested only in the most recently-built facilities.

To get more current data, I surveyed logistics and warehousing projects constructed in the last two years in Florida and nationwide. Even these numbers might exaggerate the number of jobs because actual post-construction "space per worker", using the latest technologies, will likely be more labor-saving than the pre-construction, publicly-announced "promised" number. On the other hand, the facility might be built, but never finished (Lewis, 2023). For example, the new Amazon plant in Homestead, Fl., had announced in 2020 that 300 workers would be needed for its 9 million sf (836.1 thou. m^2) plant. I visited the plant in the spring of 2023 and found the finished shell, but no equipment installed, and the parking lot vacant.

In winter 2021-22, a new Amazon plant opened in Pembroke Park (near Ft. Lauderdale), and for the first time, the public got an inside glimpse of the "robot-jobs" that the proposed SDLTD would bring. South Dade TV headlined its tour, "More Robots Than Jobs." (Anwer, 2021) In view of these qualifications, our survey results, presented in **Table 10** based on data from 10 recently constructed U.S. plants, may be overstating the actual jobs because much of the data is based on pre-construction "space per worker" parameters which change yearly as innovation progresses. The final post-construction job numbers—resulting from a yet larger space required by each worker—would be even fewer than anticipated.

The four Florida plants registered between 3300 and 3456 sf (254 and 307 m^2) per wkr. for the simple & weighted averages. The six other plants from Alabama, Pennsylvania, Virginia, and Michigan averaged between 2700 & 3150 sf. (251 & 293 m^2 per wkr., and the simple and weighted averages for all 10 plants are 3272 sf/wkr (304 m^2 per wkr.) and 3226 sf/wrk (300 m^2 per wkr.) (Table 10) I used the simple average of the 10-plant survey, together with the latest IMPLAN model for Miami Dade County, to calculate the job numbers comparable to the applicant's estimates.

There are several further adjustments that should be considered: 1) continued automation leading to greater job reductions in the future; 2) displaced workers and income lost because agricultural lands are removed from cultivation; 3) loss of value to the neighbors and residences of the surrounding houses, the "dis-amenity value" due to traffic congestion and noise from having an industrial park in the neighborhood.

5.2. The Results

The applicant's estimates of jobs are shown in cols. 1, 2, and 6, in the upper panel of Table 12 for all three phases of projects Sunfish 1 and 2, and in the lower panel, columns 2 and 6 for the sum of only Phases 1 and 2 for both projects. These are compared to my estimates in columns 3 and 7. The number by type of job—direct, indirect, and induced—is estimated for the construction and warehouse components of each project (lines 1 - 3, 5 - 7, 9 - 11, 13 - 15). The sum of these three job categories appears as "Subtotal, DII" (lines 4, 8, 12, 16). The two bottom rows of each column give (a) the total of all direct-only jobs (lines 8a, 16a) and (b) the grand total of all direct, indirect, and induced (DII) Jobs (lines 8b, 16b).

The colored boxes facilitate the comparison of the applicant's and my estimates of jobs for each Project (Sunfish 1 and 2), for each expenditure component (construction and warehousing), and for each job impact level (direct, indirect, induced, and totals). The blue boxes pair the estimates for direct jobs, and the pink boxes pair the estimates for the DII jobs.

In Sunfish 1 the applicant had originally estimated total direct employment of 18,768 jobs, summed from 7340 (direct construction), and 11,428 (direct warehousing), (lines 1, 5, 8a, col. 2). These compare to my estimates of 6123 jobs (direct construction) and 5019 (direct warehousing), totaling 11,142 jobs, which is 7600 or 41% fewer jobs than the applicants (lines 1, 5, 8a, col. 3).

The gap is even greater when the direct, indirect, and induced (DII) jobs are included. The applicant estimated subtotal DII construction jobs at 13,423 and subtotal DII warehousing at 17,446, giving a grand total (col. 2, line 8b) of 30,869 jobs, a widely publicized number. I estimate total construction jobs to be 9735 and warehouse jobs, 7326 (col. 3, lines 4, 8), yielding a grand total of 17,061, which is almost 14,000 or 45% fewer jobs than the applicants (col. 3 - 5, line 8b).

For Sunfish 2, the gaps between our estimates are similar but the scale is reduced due to the fewer acres (hectares) to be developed. In round numbers, the

Table 12. Comparison of job estimates: applicant vs. the professor.

		All Phases 1 - 3											
		2021. Sunfish-1					2022 Sunfish-2						
	Job Type	Applicant's Original Estimates-2021		RW Estimate RW-2021	Differences, cols. 2 - 3		Applicant 2022	RW 2022	Differences, cols. 6 - 7		Ratios: All Job Types to Direct		
		May 12	July 30	Nov 1	%	#	Sept. 1	Nov. 1	%	#	Appl.	RW	
		1	2	3	4	5	6	7	8	9	10	11	
Construction													
1	Direct	7340	7340	6123	16.58	1217	5103	3999	21.6	1104	1.00	1.00	
2	Indirect	3060	3062	1316	57.02	1746	2126	860	59.5	1266	0.42	0.21	
3	Induced	3021	3021	2297	23.97	724	2103	1502	28.6	601	0.41	0.38	
4	**Sub Total (DII)**	13,423	13,423	9735	27.48	3688	9334	6364	31.8	2970	1.83	1.59	
Warehouse						-				-			
5	Direct	16,738	11,428	5019	56.08	6409	7239	3315	54.2	3924	1.00	1.00	
6	Indirect	3920	2676	1368	48.88	1308	1694	892	47.3	802	0.23	0.27	
7	Induced	4895	3342	937	71.96	2405	2083	614	70.5	1469	0.29	0.19	
8	**Sub Total (DII)**	25,553	17,446	7326	58.01	10,120	11,016	4823	56.2	6193	1.53	1.46	
	All Jobs:												
8a	**Direct Only**	24,078	18,768	11,142	40.6	7626	12,342	7314	40.7	5028	-	-	
8b	**Direct, I, Ind**	38,976	30,869	17,061	44.7	13,808	20,350	11,187	45.0	9163	-	-	

		Phases 1-2 only, Most Probable Scenario												
		2021 Sunfish-1					2022 Sunfish-2							
	Job Type	Applicant's Original Estimates-2021		RW Estimate RW-2021	Differences, cols. 2 - 3		Applicant 2022	RW 2022	Differences, cols. 6 - 7		Corrected Job Estimates			
		May 12	July 30	Nov 1	%	#	Sept. 1	Nov. 1	%	#	Appl. '21	RW '21		
		1	2	3	4	5	6	7	8	9	10	11	12	
Construction											col. 6	col. 7	corrected for:	
9	Direct	4775	4775	4026	15.7	749	3426	2787	18.7	639	343	279	Construction	9a
10	Indirect	1990	1990	865	56.5	1125	1429	599	58.1	830	143	60	jobs only,	10a
11	Induced	1965	1965	1510	23.2	455	1412	1047	25.8	365	141	105	10-yr.	11a
12	**Sub Total (DII)**	8732	8732	6401	26.7	2331	6267	4437	29.2	1830	627	444	build-out	12a
Warehouse		-				-				-				
13	Direct	10,685	7277	2882	60.4	4395	5029	2394	52.4	2635	**3011**	**1433**	**Warehousing**	**13a**
14	Indirect	2502	1704	774	54.6	930	1200	636	47.0	564	**718**	**381**	**5% annual**	**14a**
15	Induced	3035	2128	533	75.0	1595	1467	440	70.0	1027	**878**	**263**	**automation**	**15a**
16	**Sub Total (DII)**	16,312	11,109	4190	62.3	6919	7797	3471	55.5	4326	**4668**	**2078**	**for 10 yrs.**	**16a**
	All Jobs:													
16a	**Direct Only**	15,460	12,052	6908	42.7	5144	8455	5181	38.7	3274	3354	1712		
16b	**Direct, I, Ind**	**25,044**	**19,841**	**10,591**	**46.6**	**9250**	**14,064**	**7908**	**43.8**	**6156**	**5295**	**2522**		

Sources: Cols, 1, 2, 6 from Dolkart (2021a, 2021b); Cols. 3, 7 computed from IMPLAN 2022 model of Miami-Dade County.

applicant estimates 5000 direct construction jobs and 7000 warehouse jobs totaling 12,000 direct jobs, compared to my estimates of 4000 construction and 3000 warehouse jobs, for a total of 7000 direct jobs, which is 41% fewer than the applicants. (See cols. 6 - 7, lines 1, 5, 8a). For Sunfish 2, the applicants estimated a total of 20,350 DII jobs compared to my estimate of 11,187 jobs, a difference of 9163 or 45% fewer DII jobs. These differences are mainly due to the gap in the ratio of space per worker (sf or m^2 per wkr.) used by the applicant, as well as my disaggregating the construction activity into three subsectors.

Construction jobs are also "annualized" as follows: The estimated number of direct construction jobs should be divided by 10, reducing their single-year estimate of 3426 to 343 jobs/yr. (compare **Table 12**, col. 6 & 10, line 9), since Phases 1 and 2 for Sunfish 2 are the most likely alternatives to be built with a realistic 10-year build–out. Similarly, the subtotal DII for construction jobs, estimated at 6267, should also be reduced to 627. The applicant's adjusted annual estimates of 343 and 627 above should be compared to my estimates of 279 for and 444, respectively (Compare col. 10, lines 9, 12 to col. 11, lines 9, 12).

A further adjustment should be made for anticipated automation. Two recent studies confirm the accelerated pace of innovation in labor saving machinery in the logistics industry. (Research & Markets, 2021, 2023) estimated a compounded annual growth rate of 10%. But for this study, I will assume a conservative rate of innovation of automation at 5% per year for the next 10 years. This reduces the number of the applicant's direct warehouse jobs from 5029 to 3011 (col. 6 &10, line 13) in 10 years and the sub total DII for warehousing from 7797 to 4668 jobs (line 16). This reduction in jobs would even be greater if the full rate of expected innovation is realized at 10%. By comparison, my own estimates anticipate that direct warehouse jobs would fall from 2394 to 1433 due to automation and total DII warehousing jobs would fall from 3471 to 2078 jobs (cols. 7, 11; lines 13, 16).

The final results (cols. 10 & 11, line 16a, b) provide the sums of construction and warehouse jobs for Sunfish 2 from the two phases likely to be built in the next 10 years. The applicants estimate the total direct employment, which is the number of jobs likely to accrue to people in the South Dade area, to be 3354 (col. 10, line 16a) in contrast to my estimate of 1712 jobs. However, if the ripple effect is considered, then the number of Miami Dade jobs may be 5295 according to the applicants, in contrast to my estimate of 2522 jobs (cols. 10 - 11, line 16b).

To sum up, South Dade may get 1700 direct jobs and the entire County may get a total of 2500 DII jobs from this project, rather than the applicant's originally announced 8455 direct and 14,000 DII jobs from Phases 1 & 2 of the Sunfish 2 Project.

There may be an easier way to get jobs without breaking the UDB. First, megaprojects, especially mega–robot projects, or projects to attract large company headquarters, simply do not work. (See (JP Morgan Chase, 2019), also the Brookings studies by (Liu 2018, 2019)). Rather, the County can build on the already existing advantages and specialties of the region—its unique weather, en-

vironment, and tourist attractions, its reputation for hospitality and cuisine, and the farms that grow tropical foods, flowers, and ornamental plants; its recreational opportunities, water sports and fishing—in short, its reputation as the winter vacation land for North America and the commercial capital for South America and the Caribbean.

5.3. Other Economic Costs

Other economic costs, benefits, and losses include the following:

1) The loss of agricultural output and employment.

2) The loss of ecosystem services provided by the 800 ac (324 ha.) in sweet corn, tree crops or fallow; and

3) The loss of amenities to the surrounding neighborhoods of the project which will bring air and traffic pollution with the thousands of trucks daily loading and unloading. The result will be a loss of value to the neighborhood house owners and a decline in tax revenue to the county and municipalities. (Lyons, 2021)

The loss due to the creation of a 324-hectare (800-acre) "disamenity" can be valued in two ways. First, by using the cost of constructing a storm water treatment area (STA) similar to those being built as a part of Everglades Restoration in the Everglades Agricultural Area (EAA) and for the St. Lucie Reservoir. That cost is approximately $9500 per acre ($23,480/ha.) or $7.6 million for an 800-ac. (324 ha.) equivalent, the "replacement cost" that society would have to pay to restore the natural filtration and storage capacity of the targeted land.

A second disamenity, or market "loss" will be perceived by nearby homeowners due to truck traffic, air, and noise pollution associated with logistics centers. This loss can range from 5% to 20% of property value and depends on many factors, such as distance from and visibility of the disamenity. The reverse is true if the approximately 800 ac. (324 ha.) were purchased for recreation and restored as a wildlife preserve and park. Crompton & Nichols (2021) conclude:

> The studies' results suggest that a positive impact of 20% on property values that were abutting or fronting a passive park area is a reasonable starting point. [In the case of a heavily used park…] the approximate increment… may reach 10% on properties two or three blocks.

The IMPLAN model of Miami-Dade County was used to estimate the job losses due to agricultural displacement (**Table 13**, lines 1 - 3). The currently operating farms employ 194 direct workers (line 4), and 356 total DII or "ripple-effect" workers, producing $27.2 million worth of produce and generating labor income of $18.6 million.

The value of ecosystem services generated on this agricultural land is currently $844,470 per year (**Table 13**, line 12, col. 7). However, if these 763 agricultural acres (309 ha.) were restored to a freshwater wetland (line 13, col. 7), the value of the ecosystem services generated by the wetland would be $12.62 million per

Table 13. Omitted casualties: Farm production, farm jobs, & value of ecosystem services.

		1	2	3	4	5
	Crops	**Ac.**	**Hectares**	**Value ($thou.)**	**$/ac**	**$/ha.**
1	Nurseries	534	216	27,764	51,992	128,503
2	Sweet corn	229	93	870	3798	9390
3	**Total**	763	309	**28,634**		

Source: cols. 1, 3 from US Dept. of Agriculture/NASS (2018, 2021). See also Li et al. (2017).

	Jobs in Agriculture	**#**
4	Direct	194
5	Indirect	97
6	Induced	65
7	**Total Jobs**	**356**
8	Labor income ($mill.)	18.6
9	Value added. ($mill.)	27.2

Source: computed from IMPLAN, Miami-Dade Model, 2021.

Comparison of current value of ecosystem services in agriculture to restored wetlands.

		1	2	3	4	5	6	7
	Current Use	$/acre** (1994)	$/ha (1994)	Cosumer price index (1.83). $/ac 2021	Cosumer price index (1.83). $/ha 2021	# ac	# ha	Total Annual Value ($thou.)
10	Nurseries (tropical forest)	844	2086	1545	3817	534	216	824.8
11	Sweet corn (ag cropland)	47	116	86	213	229	93	19.7
12	**Ecosystem services, current mix:**							**844.5**
	If restored as:							
13	**Freshwater wetlands**	8622	21,310	15,778	38,997	763	309	**12622.6**

**Sources: Col. 1 values from Costanza (1997), cited in Weisskoff (2005), T.10.6, line 18, originally stated in 1994$, inflated to 2021$ from Federal Reserve Bank of Minneapolis (2023), CPI series. Col. 1 values are for the sum of 17 specific ecosystem services.

year. (Ecosystem services include at least 17 categories ((Weisskoff, 2005) Table 10.6). For tropical wetlands, the most important of these are gas regulation, water supply, water regulation, sediment retention, waste treatment, water quality improvement, refugia, food production, raw materials, recreation, and cultural benefits.)

5.4. Effects on Existing Residential Neighborhoods

The 1480 homes, valued at an average of $200,000 each, total $300 million worth of real estate that surrounds the proposed industrial site. There are two possible effects of this project on these homes. The first comes from flooding. The concrete platform to be constructed 10 ft. (3 m.) high, would convert the C-120

Canal into a "canyon", and once the concrete platform is finished, the concrete platform could have the effect of "corking" the free flow of the canal, potentially backing up the waters into the residential districts which lie at a lower level. Major rain events, storm surges, hurricanes, and sea level rise could all result in significant flooding. Anticipating such an event, the SFWMD would be required to provide flood protection for both the project and the thousands of homes that the project would jeopardize! Currently, the waters of the C-120 Canal drain into the open farmland at the mouth of the canal, restraining saltwater intrusion and recharging the aquifer.

The five existing urbanizations that surround the project on the three sides now create a rustic, peaceful, and country-like setting despite the high density and the minimal-sized plots. The replacement of the open land to the south of these neighborhoods with the 379-ac (153-ha.) Logistics Center will change the entire character of the region from a residential/farming area into a trucking entrepôt, replacing the *amenity* of tree farms and fields of sweet corn with the *disamenity* of an industrial park (Waddell, 2021). This type of disability can result in a loss of 10 to 20% of property values for nearby residences, or in this case, a total of least $20 - $30 million property value loss to homeowners in the immediate area (Mendelsohn & Olmstead, 2009).

Finally, the "perfect storm" with sustained rains similar to Hurricane Sandy in 2012 or winds similar to Hurricane Andrew in 1992, could create a 7 to 17 ft. (2.1 to 5.2 m.) storm surge and expose the houses to a double-edged sword of disaster from both east and west: storm surge from Biscayne Bay and flooding from the interior overflowing of the Princeton Canal. This would create homelessness for at least 5415 persons (1450 homes, average size of family 3.61, from Table 1 above) of whom 1673 are under 18 years old.

In summary, the winners of this project are five individuals or companies who become millionaires by the rezoning of their Phase 1 and 2 parcels and the few hundred workers that will be employed there. The losers will be the hundreds of homeowners whose property value will be reduced by the disamenity of the industrial park and the thousands who could potentially become homeless in the event of flooding and storm surge (See (Ready & Aballa, 2005), on amenity value of agriculture on residential values; (Kroeger, 2008) on the premium of open space on residential values; (Fetchel & Hall, 2003), on residential value of green plants; (Lovelace & McPherson, 1998) on Hurricane Andrew in South Florida).

6. Conclusion

The poverty and low income of the region must be addressed, as well as the needs of the farmers, landholders, and the tens of thousands of new homeowners that are moving to these South Dade suburbs, finding themselves in bumper-to-bumper traffic commuting from their zero-plot housing sub-divisions. To thrust a truck depot into this mix is the wrong industry, in the wrong place, at the wrong time.

The project modeled here would not contribute significantly to greater em-

ployment or higher incomes. On the contrary, it could open the residential area to potential catastrophic danger from storm surge and inland flooding. Instead of the industrial park, another kind of park could address the recreational, ecological, and agricultural needs of the area, offering something better for both the land holders that want to sell out and for those who want to continue farming: a South Dade Multi-Purpose (Recreational, Ecological, & Agricultural) Park & Nature Preserve (acronym: REAP-NP), a multi-purpose Park to harvest and share the fruits of the region in the public interest and protect their homes and surroundings with nature, a park, and open space.

The Multi-Purpose Park and Nature Preserve would include a working model-farm, a perpetual farmer's market showcasing locally-grown foods, an equestrian therapy unit for young children, a guide to farm visitation in South Florida, a visitors' center to introduce travelers to South Florida, the Keys, and to the two nearby National Parks; recreational fields for soccer, basketball, and baseball in the area closest to the Turnpike. The neighborhoods on the north side of the Turnpike would access the park via a pedestrian tunnel beneath the Turnpike. The Nature Preserve section of the park will be accessed from its western side, where visitors will find a Nature Center, the canoe and kayak rental center, and the foot and bike trails that lead through the restored wetlands (Meeder & Harlem, 2019; George Mason University, Center for Regional Analysis, 2018). Visitors may climb up the 15-meter (50-foot) observation tower for bird and wildlife-watching and stroll the extensive boardwalks through the marshes along the Canal to the Bay.

All this activity will bring jobs in sales, maintenance, food and refreshments services, nature guides, and instructional classes. This too is the appropriate gateway park to South Dade, serving its intensively settled neighborhoods and the millions of visitors that come to appreciate South Florida's parks, farmlands, and open spaces.

The Park will be a job creator, energizing neighborhoods, educating youth and providing recreation, showcasing farming practices compatible with marshy

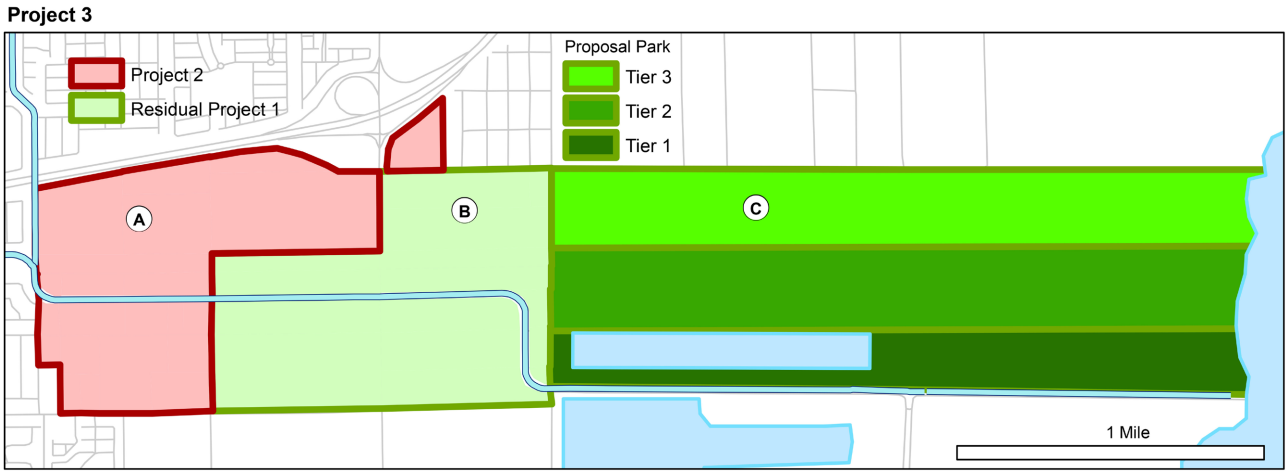

Figure 5. The alternative: a **R**ecreational, **E**cological, & **A**gricultural **P**ark **& Nature Preserve**.

soils, and preserving the natural beauty of the region. The Park could include all the land of Sunfish 2 (labeled A in Figure 5) and the remainder of Sunfish 1 (B in Figure 5) and the different horizontal tiers of existing farm and public land.

It is ironic that the first steps towards such a vision had been taken in the past when the South Florida Water Management District (SFWMD), the Miami-Dade County Parks Department, and the National Park Service all purchased much of the Biscayne Bay's natural mangrove frontage and the lands alongside the C-120 Canal. The South Dade Multi-Purpose Park and Nature Preserve (REAP-NP) can connect these public lands "from the Biscayne Bay to the Florida Turnpike", making an otherwise inaccessible area available to South Dade's cloistered residents and to downtown Miami, a short 20-mile drive to the north. The very Turnpike that has marked the urban boundary of this region, protected its farmland and wetlands and which now makes the area so lucrative for developers, can facilitate visitors from Florida and other states to this magnificent site for a REAP-NP, the true alternative for the proposed industrial park.

Acknowledgements

I wish to thank my colleagues of the Hold the Line Coalition for their encouragement and courage; to Mr. Chris Hanson for the graphics; for my students who braved public meetings and researched the affected neighborhoods and the park alternatives; thanks to the anonymous referees of this *Journal* for their positive and challenging comments.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

Amazon Press Center (2021). *Amazon Expands Investment with Four New Operations Sites in Alabama.* https://press.aboutamazon.com/2021/11/amazon-expands-investment-with-four-new-operations-sites-in-alabama

Andrade, N. (2018). *How Many Employees Do I Need to Manage a 150-Room Hotel?* https://www.quora.com/How-many-employees-do-I-need-to-manage-a-150-room-hotel

Anwer, S. (2021). Amazon Opens Facility in South Florida with More Robots than Workers. *WPLG Local 10 News.* https://www.local10.com/news/local/2021/12/09/new-amazon-robotics-facility-in-pembroke-park-first-in-state-of-florida/

Bacchus, S. T. (1995). Improved Assessment of Baseline Conditions and Change in Wetlands Associated with Groundwater Withdrawal and Diversion. In K. J. Hatcher (Ed.) *Proceedings of the 1995 Georgia Water Resources Conference* (pp. 158-167). University of Georgia.

Bacchus, S. T. (2002). The "Ostrich" Component of the Multiple Stressor Model: Undermining Florida. In J. W. Porter, & K. G. Porter (Eds.), *Everglades, Florida Bay, and*

Coral Reefs of the Florida Keys: An Ecosystem Sourcebook (pp. 669-740). CRC Press.

Bacchus, S. T. (2006). Nonmechanical Dewatering of the Regional Floridan Aquifer System. In: R. S. Harmon, & C. Wicks (Eds.), *Perspectives on Karst Geomorpholgy, Hydrology, and Geochemistry* (pp. 219-234). Geological Society of America. https://doi.org/10.1130/2006.2404(18)

Bercow Radell Fernandez Larkin & Tapanes (2021). *Developers Seek to Expand Miami Dade Development Boundary by 792 Acres.* https://brzoninglaw.com/news/client-news-developers-seek-to-expand-miami-dade-development-boundary-by-792-acres/

Bryant, J. (2021). South Florida's Largest Business Parks Ranked by Development Acres. *South Florida Business Journal*.

Business Wire (2021). *Amazon Announces New Robotics Fulfillment Center Plus Five New Delivery Stations in Florida, Bringing Total State Investments to Over $18 Billion.* https://www.businesswire.com/news/home/20210811005557/en/Amazon

Carlson, B. D., Propst, D. B., Stynes, D. J., & Jackson, R. S. (1995). *Economic Impact of Recreation on the Upper Mississippi River System.* U.S. Army Corps of Engineers, Waterways Experiment Station.

CBRE Inc. (2022). South Dade Logistics Park: Confidential Offering Memorandum. Miami. https://www.politicalcortadito.com/2022/11/15/memo-relationships-udb-expansion-miami-dade/

Clouse, C. (2019) *Construction: Building Across Years.* https://support.implan.com/hc/en-us/articles/360040512733-Construction-Building-Across-Years

Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B. et al. (1997). The Value of the Word's Ecosystem Services and Natural Capital. *Nature, 387,* 253-260.

Crompton, J. L., & Nicholls, S. (2021). *The Impact of Property Values of Parks, Trails, Golf Courses, & Water Amenities*. Sagamore-Venture Publishing.

Dale, N. (2004). *Where the Swallowtail Kite Soars: The Legacies of Glades County, Florida & the Vanishing Wilderness*. IUniverse.

Dale, N. (2006). "*Would Do, Could Do, Made Do*": *Florida's Pioneer* "*Cow Hunters*" *Who Tamed the Last Frontier*. iUniverse.

De Stefano, J. (2020). Philly Finally Gets 1 Million Square-Foot Warehouse, but Not the Thousands of Jobs: UPS on Red Lion Road Will Be "Highly Automated". *Philadelphia Inquirer*. https://www.inquirer.com/columnists/ups-red-lion-road-northeast-philadelphia-budd-plant-20200210.html#:~:text=Opinion

Derr, M. (1989). *Some Kind of Paradise: A Chronicle of Man and the Land in Florida*. William Morrow.

Deutsche, K. (2021). New Amazon facility in Coral Springs Will Create 200 Jobs. *Coral Springs Talk*. https://coralspringstalk.com/amazon-in-coral-springs-will-create-jobs-34178

Dolkart, A. (2021a). *Application to Amend the Comprehensive Development Master Plan (CDMP) South Dade Logistics and Technology District (May 12).* Miami Economic Associates Inc.

Dolkart, A. (2021b). *Application to Amend the Comprehensive Development Master Plan ("CDMP") South Dade Logistics and Technology District (July 30).* Miami Eco-

nomic Associates Inc.

Douglas, M. S. (1988). *The Everglades: River of Grass*. Pineapple Press.

Dudley, S. (2004). Nowhere Left to Build. *Miami New Times.* https://www.miaminewtimes.com/news/nowhere-left-to-build-6345527

Editorial Board (2022a). Miami-Dade Needs Affordable Housing, but Not at the Expense of the Everglades. *Miami Herald*.

Editorial Board (2022b). Reject Questionable South Dade Development, Commissioners, Everglades Must Come First. *Miami Herald*.

Federal Reserve Bank of Minneapolis (2023). Consumer Price Index, 1913-. https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913-

Ferreira-Miani, P. (2021). *Complementary Comments on Economic Study CDMP 20210003.* Tropical Audubon Society.

Fetchel, M., & Hall, C.R. (2023). An Update of the Literature Supporting the Economic Benefits of Plants: Part 2 Increased Property Values. *Journal of Environmental Horticulture, 41,* 14-26. https://ellisonchair.tamu.edu/files/2023/03/JEH-Part-2-Property-values.pdf

Fishkind & Associates (n.d.). *Florida Fiscal Impact Analysis Model (FIAM).* http://www.sfrpc.com/fiam.htm

Fried, N. (2022). Don't Move the UDB. Instead, Reject Harmful Industrial Park to Save South Dade's Farmland, Opinion. *Miami Herald*.

George Mason University, Center for Regional Analysis (2018). *Promoting Parks & Recreation's Role in Economic Development*. National Recreation & Park Assoc.

Glenn, L. (2021). *Miami-Dade County DEO Number 21-2 ESR, Comments on Proposed Comprehensive Plan Amendment Package October 22.* Office of the Director, Water Resources Division, South Florida Water Management District.

Grunwald, M. (2006). *The Swamp: The Everglades, Florida, and the Politics of Paradise*. Simon & Schuster.

Hanks, D. (2021a). Project in South Miami Dade Sets Up 2021's First Fight Over Urban Development Boundary. *Miami Herald*.

Hanks, D. (2021b). Urban Development Boundary—Leonard Abess Backs Off of Zoning Push for South Dade Project that Wants UDB Moved. *Miami Herald*.

Hanks, D. (2021c). Project in South Miami—Date Set Up 2021's First Fight over Urban Development Boundary. *Miami Herald.*

Hanks, D. (2022a). Miami-Dade Commission Delays UDB Vote Again, Giving Developers More Time to Make Their Case. *Miami Herald.*

Hanks, D. (2022b). Four Factors Complicate Urban Development Boundary. *Miami Herald*.

Hanks, D. (2022c). Miami-Dade Mayor Vetoes Project Near Biscayne Bay. *Miami Herald*.

Hanks, D. (2022d). Guide to Biggest Environmental Vote Yet for Mayor Cava Levine. *Miami Herald*.

Hanks, D., & Harris, A. (2022a). Vote on Moving Development Line so Warehouses Can Be Constructed Is Delayed, the Developers of the Proposed 800-Acre Complex Lacked the Support They Needed to Prevail. *Miami Herald*.

Hanks, D., & Harris, A. (2022b). Leonard Abess Says, He Would Make $100 Million Off Rural Miami-Dade Development, But He Opposes Project. *Miami Herald*.

Hanks, D., & Harris, A. (2023). State Questions Approval of South Dade. *Miami Herald*.

Harris, A. (2022). Developers Claim Warehouses Would be Good for Biscayne Bay-Miami-Dade Commissioners Are Set to Vote Thursday on a Project that Environmentalist Say Will Worsen Water Quality in Biscayne Bay& Developers Say Will Improve It. *Miami Herald.*

Hevia, J., & Blumenthal, S. (2022). South Dade Development Will Create Jobs While Protecting Environment. *Miami Herald.* https://www.miamiherald.com/opinion/op-ed/article261349452.html

Hold the Line Coalition (2022). *Critique: South Dade Logistics & Technology District Environmental Considerations & Beneficial Impacts.* https://docs.google.com/document/d/1IHhH8-dh4EJR4ZdwBe2GdWy5d8xLrlM0ZrRB9dWVoIk/edit

Hold the Line Coalition (2023). *Miami-Dade County Resident Granted Approval to Intervene in Legal Fight Over Urban Development Boundary Expansion.* https://docs.google.com/document/d/1zshEjwVvMDvALTqHY7RW5tdx67RgAX8baNGl46rhIa0/edit?pli=1

Hunter, E. B. (2021). *Best Warehouse Automation Innovations to Reduce Labor Costs.* https://rapid-veyor.com/2021/10/12/best-warehouse-automation-innovations-to-reduce-labor-costs/

JP Morgan Chase (2019). The Big Impact of Small Businesses on Urban Job Creation: Evidence from 10 Cities. https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/documents/sbf-big-impact-small-business-rpt.pdf

Kasba, J. (2021). Amazon Opens New "XL" Fulfillment Center in Huron Township. *News-Herald.* https://www.thenewsherald.com/2021/09/18/amazon-opens-new-xl-fulfillment-center-in-huron-township/

Klas, M. E. (2023). Legislators Side with Developers, Pass Bill to Restrain Citizen Opposition to Growth. *Miami Herald.*

Kolmar, C. (2021). *How Much Office Space Do You Need per Employee?* https://www.avuity.com/employees-per-square-foot/#:

Kroeger, T. (2008). *Open Space Property Value Premium Analysis.* National Council for Science and the Environment. https://defenders.org/sites/default/files/publications/open_space_property_value_premium_analysis.pdf

Langan, Inc. (2021). *Conceptual Stormwater Management Master Plan, MDG.* Miami Dade County Government.

LePradd, C. (2021). *Comments on CDMP Application 20210003 June 25.* Office of Miami-Dade County Agricultural Manager.

Levine Cava, D. (2022). *Veto and Veto Message. Office of the Mayor.* Miami-Dade County.

Lewis, M. (2023). Huh? Amazon Hiring 250,000 But Can't Staff a Warehouse? *Miami Today News.* https://www.miamitodaynews.com/2023/09/26/huh-amazon-hiring-250000-but-cant-staff-a-warehouse/

Li, Y. C., Li, Y. C., Olczyk, T., & Liu, G. D. (2017). *Sweet Corn Production in Miami-Dade County, Fl.* UF/IFAS Extension. https://edis.ifas.ufl.edu/publication/tr013

Liu, A. (2018). Landing Amazon HQ2 Isn't the Right Way for a City to Create Jobs. Here's What Works Instead. *Harvard Business Review.*

https://hbr.org/2018/07/landing-amazon-hq2-isnt-the-right-way-for-a-city-to-create-jobs-heres-what-works-instead

Liu, A. (2019). Key Lessons from Amazon's Search for a Second Headquarters Location. In *SACRPH Big Tech in the City Conference*, Brookings Institution.

Lovelace, J. K., & McPherson, B. F. (1998). Restoration, Creation, & Recovery: Effects of Hurricane Andrew (1992) on Wetlands in Southern Florida and Louisiana. National Water Summary on Wetland Resources.
https://water.usgs.gov/nwsum/WSP2425/andrew.html

Lyons, D. (2021). Amazon Plans Huge Sunrise Fulfillment Center. Neighbors Are Concerned About the Trucks. *South Florida Sun-Sentinel.*
https://www.sun-sentinel.com/2021/02/16/amazon-plans-huge-sunrise-fulfillment-center-neighbors-are-concerned-about-the-trucks/

McKelvey, O. (2020). FedEx Planning Regional Center in Port St. Lucie; Construction to Begin in January, Dec. 7. *Treasure Coast Newspapers.*
https://www.tcpalm.com/story/news/2020/12/07/

McKelvey, O. (2021). FedEx Sorting Center in Port Saint Lucy's Legacy Park to be Operational by November. *Treasure Coast Newspapers.*
https://www.tcpalm.com/story/news/2021/02/03/fedex-regional-sorting-center-coming-port-st-lucie-operational-nov/6677420002/

Meeder, J. F., & Harlem, P. W. (2019). Origin & Development of True Karst Valleys in Response to Late Holocene Sea-level Change, the Transverse Glades of Southeast Florida, USA. *The Depositional Record.*
https://onlinelibrary.wiley.com/doi/epdf/10.1002/dep2.84
https://doi.org/10.1002/dep2.84

Mehigan, D. (2016). *What Is the Average Square Footage of Office Space per Person?* TMC, Mehigan Company, Inc. https://mehiganco.com/wordpress/?p=684

Mendelsohn, R., & Olmstead, S. (2009). The Economic Evaluation of Environmental Amenities and Disamenities: Methods and Applications. *Annual Review of Environment and Resources, 34,* 325-347.
https://doi.org/10.1146/annurev-environ-011509-135201

Miami-Dade Board of County Commissioners (2022). *Comprehensive Development Master Plan (CDMP) & Zoning Meeting.*
https://www.facebook.com/MiamiDadeBCC/videos/51922-cdmp-zoning-meeting/712627546457810/

Miami-Dade County Government (MDG) (2021). *Plan Number: CDMP20210003.* Department of Regulatory & Economic Resources.
https://energov.miamidade.gov/EnerGov_Prod/SelfService/#/plan/daa9f46a-bb7d-4a9d-952c-37c44eb552ee?tab=attachments

Miami-Dade County Property Appraiser (2022). *Files of All Properties.*
https://www.miamidade.gov/Apps/PA/PropertySearch/#/

Miller, G. (2021). South Dade Project Is Game Changer for Local Jobs.
https://communitynewspapers.com/south-dade/south-dade-project-is-game-changer/

Minnesota IMPLAN Group Inc. (1999). *IMPLAN Professional Ver. 2.0, Social Accounting & Impact Analysis Software*. MIG Inc.

Minnesota Secretary of State (2023). *Business Record Search.* Minnesota Implan Group Inc.
https://mblsportal.sos.state.mn.us/Business/SearchDetails?filingGuid=ad037499-b1d4-e011-a886-001ec94ffe7f

Montgomery City, AL (2022). Amazon Announces New $100M Facility in Montgomery,

Expanding Alabama Footprint. *In the News.* https://www.montgomeryal.gov/Home/Components/News/News/4186/193

Morales, A. (2020). FedEx Begins Construction on Distribution Facility in Florida. *Transportation Topics News*. https://www.ttnews.com/articles/fedex-begins-construction-distribution-facility-florida/

North Carolina Secretary of State (2023). *Business Registration Search. IMPLAN Group LLC.* https://www.sosnc.gov/online_services/search/Business_Registration_Results

Plans, J. (2009). *Notes from Fishkind & Assoc. Fiscal Impact Analysis Model (FIAM).* https://www.cyburbia.org/forums/threads/square-feet-per-employee.25827/

Potravny, I., Gusev, A., Stoykov, V., & Gassiy, V. (2017). Modification of the Leontief-Ford Input Output Model for the Green Economy Goals and Environment Protection. *Journal of Geoscience and Environment Protection*, 5, 15-23. https://doi.org/10.4236/gep.2017.511002

PROFILE Miami (2020). *Amazon to Build Largest Distribution Center in South Florida After Scoring Approval from Miami Dade County.* https://profilemiamire.com/miamirealestate/2020/7/13/amazon-to-build-largest-distribution-center-in-south-florida-after-scoring-approval-from-miami-dade-county

Ready, R. C., & Abdalla, C. W. (2005). The Amenity and Disamenity Impacts of Agriculture: Estimates from a Hedonic Pricing Model. *American Jour. of Agricultural Economics,* 87, 314-326. https://doi.org/10.1111/j.1467-8276.2005.00724.x

Research and Markets (2021). *Warehouse Automation—Robots, Technologies, and Solutions Market, 2021-2030.* https://www.researchandmarkets.com/reports/5342799/warehouse-automation-robots-technologies-and#product--sample

Research and Markets (2023). *Warehouse Automation Global Market Report 2023.* https://www.researchandmarkets.com/reports/5767469/warehouse-automation-global-market-report#src-pos-3

Reynolds, L. (2022). Promised Jobs Just Pure Speculation. *Miami Herald*.

Saint Paul Metropolitan Council (2016). Measuring Employment: How to Measure Employment Intensity & Capacity. *Local Planning Handbook*. https://metrocouncil.org/Handbook/Files/Resources/Fact-Sheet/ECONOMIC-COMPETITIVENESS/How-to-Measure-Employment-Intensity-and-Capacity.aspx

Sidersky, R. (2021). Amazon to Open East Coast Supply Chain Hub in Stafford: New Facility to Create 500 Jobs. *Virginia Business*. https://www.virginiabusiness.com/article/amazon-to-open-east-coast-supply-chain-hub-in-stafford/

Smith, P. D. (1984). *A Land Remembered*. Pineapple Press.

Snohomish County, WA (2007). 2007 Buildable Lands Report for Snohomish County. https://snohomishcountywa.gov/DocumentCenter/View/7661/2007-Buildable-Lands-Report?bidId=

South Dade News Leader (2020). *E-Commerce Giant to Build Distribution Center in Homestead Bringing 300 Jobs, Millions in Construction.* http://www.southdadenewsleader.com/news/e-commerce-giant-to-build-distribution-center-in-homestead-bringing-300-jobs-millions-in-construction/article_b96e1848-feb9-11ea-803a-b7e3ca617b7c.html

South Florida Commercial Real Estate News (2021). *Economic Impact Study Shows South Dade Logistics & Tech District Will Generate $2.46 Billion in Total Economic*

Output, Nearly 40,000 Local Jobs. SFCREN. https://cre-sources.com/economic-impact-study-shows-south-dade-logistics-tech-district-will-generate-2-46-billion-in-total-economic-output-nearly-40000-local-jobs/

South Florida Regional Planning Council (2007). *Fiscal Impact Analysis Model (FIAM): Employment Assumptions for New Development.* http://www.sfrpc.com/ftp/pub/FIAMDefined.pdf

South Florida Regional Planning Council (2021). *Regional Issues: Comprehensive-Dade County CDMP Amendment Number 21-02ESR, CDMP20210003 & CDMP20210008.* SFRPC.

Tebeau, C. W. (1957). *Florida's Last Frontier: The History of Collier County*. University of Miami Press.

U.S. Census Bureau (2021). *Quick Facts*, *Miami Localities*. https://www.census.gov/quickfacts/fact/table/miamidadecountyflorida/POP060210

U.S. Department of Agriculture (NASS) (2018). *Census of Agriculture: 2017 State and County Profiles—Florida* https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Florida/index.php

U.S. Department of Agriculture (NASS) (2021). *2020 State Agriculture Overview*. https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=FLORIDA

U.S. Energy Information Administration (2022). *Commercial Buildings Energy Consumption Survey (CBECS*). https://www.eia.gov/consumption/commercial/data/2018/#b11-b14

URS (2009). *Land/Building Needs Analysis for Targeted Industries*. Community Planning & Urban Design Group. https://www.fcgov.com/planning/pdf/land-bldg-analysis.pdf

Waddell, K. (2021). *'Warehouses in Their Backyards': When Amazon Expands These Communities Pay the Price.* https://www.theguardian.com/us-news/2021/dec/09/when-amazon-expands-these-communities-pay-the-price

Weisskoff, R. (1998). Regional Economic Impacts. In: U.S. Army Corps of Engineers (Ed.), *Central & So. Fl. Project*, *Comprehensive Review Study* (pp. 281-310). South Florida Water Management District.

Weisskoff, R. (2000). Missing Pieces in Ecosystem Restoration: The Case of the Florida Everglades. *Economic Systems Research, 12,* 271-303. https://doi.org/10.1080/09535310050120899

Weisskoff, R. (2003) A Tale of Two Models: IMPLAN and REMI on the Economics of Everglades Restoration. In: D. J. Rapport, W. L. Lasley, D. E. Rolston, N. Ole Nielson, C. O. Qualset, & A. B. Damania (Eds.), *Managing for Healthy Ecosystems* (pp. 1303-1326). Lewis Publishers.

Weisskoff, R. (2005). *The Economics of Everglades Restoration: Missing Pieces in the Future of South Florida*. Edward Elgar.

Weisskoff, R., Ruiz, A., & Puerto Rico IMPLAN Study Team (1994). *Puerto Rico IMPLAN System: Model & Database Construction & Application*. US Forest Service.

Weisskoff, R., Sukop, M., Nguyen, H., & Glodzik, K. (2020). Forecasting Water Demands in South Florida in the Context of Everglades Restoration: Retrospective. *Journal of Water Resources Planning Management, 146.* https://doi.org/10.1061/(ASCE)WR.1943-5452.0001213

WILX News.10. (2021). *Amazon Building First Mid-Michigan Fulfillment Center in Delt Township.* https://www.wilx.com/2021/09/08/amazon-building-first-mid-michigan-fulfillment-center-delta-township/

WXYZ Detroit (2021). *Amazon Announces New Fulfillment Center, Additional Facilities Coming to Michigan.* https://www.wxyz.com/news/amazon-announces-new-fulfillment-center-additional-facilities-coming-to-michigan