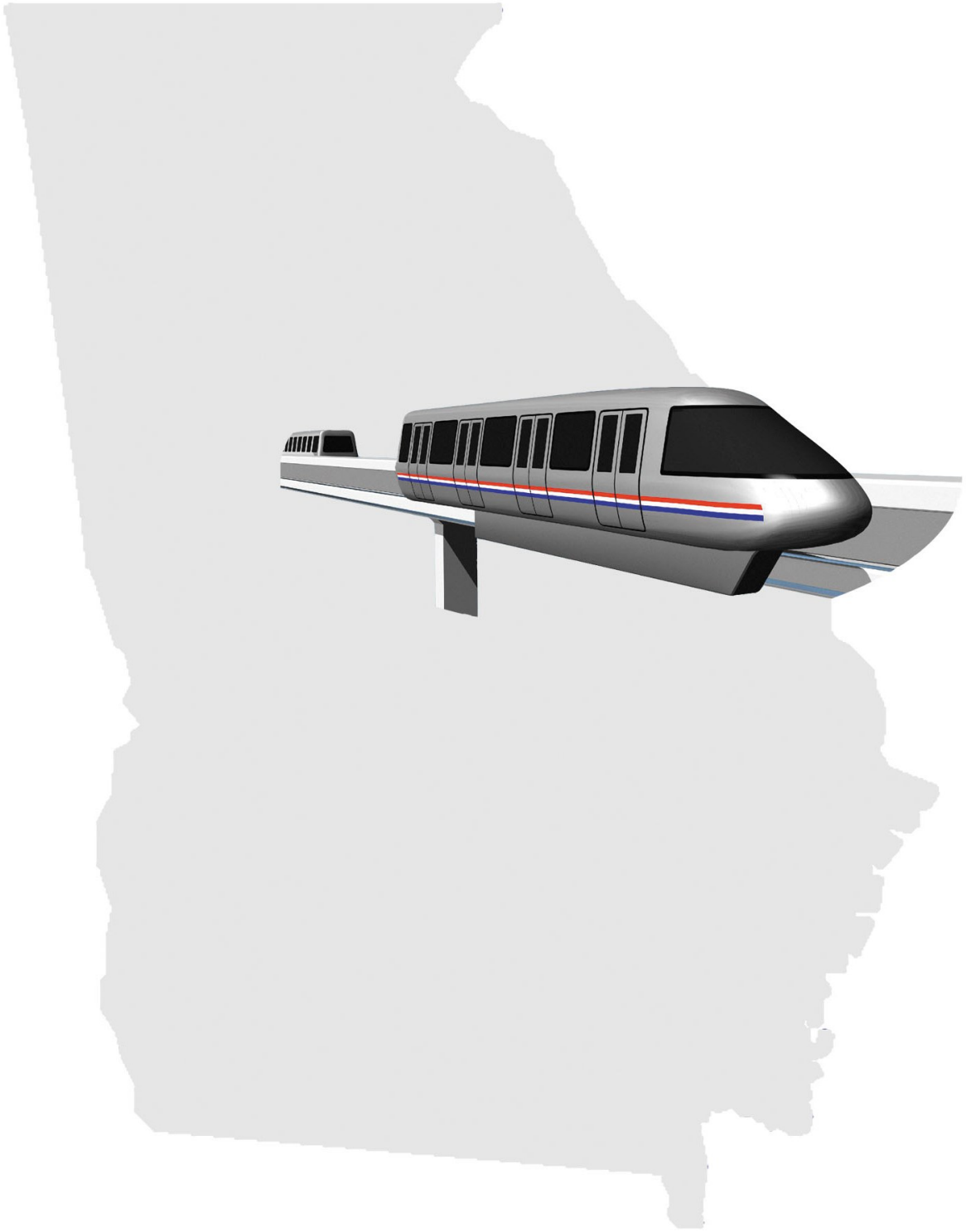
A 21st century transit solution...



for 21st century Georgia

Subject: Submittal of a Regional Transit System for Atlanta Under the Fast Starts – New Starts Program, "A 21st Century Solution for a 21st Century Georgia"
To: The Federal Transit Administration Atlanta District IV Office
By: Owen Transit Group, Inc. (OTG) February 1, 2022

This document is submitted by Owen Transit Group, Inc. (OTG), a Georgia private for-profit corporation, for the purpose of gaining approval from the Federal Transit Administration FAST – New Starts Program, United States Department of Transportation, District IV for an elevated guideway heavy-capacity transit system (*Atlanta Transit-Link System, ATL*) for the Atlanta, Georgia Region as defined by the Atlanta Regional Commission and as provided for in Georgia law as House Bill 930 in the 2018 General Assembly, known as HB-930 (2018). It contains technical descriptions of the HighRoad transit system, its environmental impacts, its adequacy of ridership to support it operations, and its economic effects on the nation, the state and the community.

The Atlanta Regional Commission, the FTA designated Municipal Planning Organization (MPO of the region) has stated that by 2040 the population of the Atlanta region is expected to increase by 40% over the population in 2015, an increase of almost 3 million people. Because they estimate that the costs of public transportation needs will be increased by $173 billion (according to ARC's Transportation Manager John Orr in Roads and Bridges Magazine, July-August 2021) and that the funds are not likely to be available from local or Federal grant sources, Owen Transit Group, Inc. has decided to make an unsolicited proposal to the ARC, the ATL Authority, and the FTA for a 372.3-mile heavy capacity rail elevated guideway transit system to cover the principal counties of that MPO region.

The requirements for gaining approvals from the FTA and other agencies of the United States Government are described in this document and are followed by the OTG submitted pages of qualification of the technology and the providing team, with supporting calculation / analysis documents as Appendices, and Predictive Analytics and References (Tables) pertaining to the ridership verification requirements.

The financing options for the HighRoad Atlanta Project were significantly expanded by Congress in HR-3684 on Nov. 15, 2021. These additional funding sources are listed in an analysis document provided by Rail Group News and provided in Part K on page 142 as "Passenger Rail Funding Law HR-3684 – Nov. 15, 2021" at the end of this document. It is believed that a CBO analysis of this financing plan will show a gain in tax revenue from net construction cash flow.

Submitted by: Owen Transit Group, Inc. 481 S. Keeler Woods Drive, Marietta, GA 30064.
404-683-1331 billowen@OTG-Inc.com

Preface: How HighRoad Began and Why it is Important to the Atlanta Region

During the latter part of the 20th century the Metropolitan Atlanta Regional Transit Authority (MARTA) proposed a multi-county plan for taxing each county's taxpayers a 1% sales tax to pay for creation of a regional heavy-rail transit system. That proposal failed in all counties except Fulton and DeKalb. The other counties declined joining in the plan because it was widely-believed that there was not sufficient tax money available to build a system for them in a reasonable amount of time. This writer was among them.

About that time the writer, William E. Owen, P.E. an engineer trained in the sciences of dynamics, mechanics, systems and business management, had a new concept of transit appear to him that seemed interesting and worthy of future analysis. That concept was (a) transit systems needed to be paid for not from taxes but from the earnings and benefits of the system being built, and (b) to do so the system needed to be sufficiently low in construction and operating cost as to be self-supporting. PART J – HighRoad Description begins on page 120 of this document and PowerPoint A. is provided in a supplemental memory stick.

In order to protect his interests in what he considered new, more efficient technology, he applied for and received two patents from the U.S. Patent and Trademark Office (USPTO) which identified the over 30 engineering features collectively described as novel and with the descriptive title "Dual-Sided Monorail". Since that time many new patentable features have been added not under patent laws but under the more valuable "trade secrets" protection system, similar to that used by Coca-Cola and other companies with knowledge that was too valuable to be placed into the international public domain. The writer now describes the technology as a "Heavy-rail Dual-sided Guideway System". Mr. Owen has personally invested heavily in development of the planning and design.

In the intervening years, without government funding and with all costs borne personally by the writer with the expectation that successful engineering, construction and operation of a system in the Atlanta region would repay him for his work, he has completed all primary engineering, performance calculations and specifications which are needed to enter into contracts for providing and operating a HighRoad system in the Atlanta region. He also has informally retained a team of skilled providers to create the system when authorized by the FTA and the governing local authorities. This is to meet the need for additional transit to assist the Atlanta Regional Commission in meeting transportation goals that are defined by the expected 40% growth of the Atlanta region between 2015 and 2040, and the capability of serving future growth needs of the region's population. Current ARC expectations are that expected public funding cannot meet the transportation growth needed if building only outdated transit technology such as MARTA rail.

While providing the submittal information for the FTA and the ATL Authority as well as for the Atlanta Regional Commission he completed a detailed cost estimate for the entire 16-year 372.3-mile project that covers 15 principal regional counties, and this is included in the following information. Also included is a financing plan for the project that uses 30-day repeating state and Federal loan / repayment cycles for the funding, supplemented by a P3 participation grant and multiple staggered 35-year revenue bonds, the sum of which results in a completed system, pays all bonds and operating costs, and does not add taxes to the people of the region.

William E. Owen, P.E.

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(Text and headings are shaded in gray for identification of FTA documents' requirements)

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PART A
DATA IN SUPPORT OF A HIGHROAD RAPID TRANSIT HEAVY CAPACITY RAIL SYSTEM IN THE ATLANTA, GEORGIA MPO REGION

The following pages principally contain criteria to be followed along with supporting information required by the FTA for a sponsor of a New Starts project under the jurisdiction of the Build America Bureau of the Federal Transit Administration of the United States Department of Transportation, and these are presented with shaded text. Comments and notations by Owen Transit Group, Inc. are presented without shading. Policy statements that support Owen Transit Group, Inc. participation as a Sponsor of the Project are presented as standard text. (FTA requirements for data and comments are in gray background text.)

I. Discretionary & Competitive Federal Grant Program

A. Funds -

1. Funds may be provided for light rail, heavy rail, commuter rail, streetcar, and bus rapid transit projects.

2. HighRoad Transit Type: Heavy rail is a description of rail with heavy passenger capacity, and not of train-type equipment or rail weight. Therefore, HighRoad elevated guideway technology with heavy rail passenger capacity is in the Heavy Rail category. **See PowerPoint A.** - A Presentation of the Basics of the Atlanta Project as taken from Excel Workbooks P. Project and R. Ridership.

B. Projects must provide data for evaluation of multi-year, multi-step process projects in order to receive funds.

1. Evaluation: Data included herein provide a multi-year, multi-step process describing the HighRoad project while being implemented. The project is planned as multiple short-time projects, with multi-steps overlapping in time, allowing frequent reassessment of costs and service to validate the long term anticipated for its completion. It is not a Federal Grant Program which, if too long, and if considered a risk too innovative, may restrict novel and innovative HighRoad technology introduction due to the expense and time consumption of an unduly-long administrative process. It is planned to continuously evaluate the progress and the conditions under which it is being built, thereby remaining under constant management. The plan is to follow long-term Federal Government Policy, promoting innovation in transit, commuter rail and intercity high-speed rail with timely implementation of sorely-needed new technology and services. See **Excel Workbook P. Project,** worksheets Sum, Funds, Opns-Cash, Labor and Opns. (Presented here as Financial Tables 1 - 5 and followed by additional supporting related Tables 6 – 11) for this multi-year analysis in Excel format, presented on the 11 pages that follow and are also accessible in Excel Workbook P. Project on the attached memory stick that can be downloaded into an Excel file on an analysis computer.

TABLE P1 - SUM ATL REGION HIGHROAD 343-MILE SYSTEM					
WITH STATE & FED. LOAN / GRANT FUNDING OPTIONS PARTICIPATING + DOT BONDS					
343.10	MILES (COL. B)		INPUTS ON THIS PAGE IN BLUE		
			3,218	RIDERS / DAY / MILE DESIGN	
2020 CONSTRUCTION COST	$ 18,400,000,000		1,104,096	DAILY	DESIGN BASIS
			60.0%	OF MARTA'S	5468
TOTAL PROJECT COST INCLUDING START-UP	$ 18,400,000,000		343.1	MILES VS	MARTA'S 48 MILES
COST PER MILE 2020	$ 53,628,680		$ 0.35	FARE PER MILE - (INP1E13)	
CONSTRUCTION CASH RECEIVED OVER 16 YEARS (2021 CONSTANT DOLLARS)					
SOURCE	AMOUNT TOTAL	$/MONTH	SHARE		
RECYCLED PROJECT GEORGIA INCOME/SALES TAX	$ 2,216,389,318	$ 11,543,694	1	12.05%	$ 2,216,389,318
RECYCLED PERSONAL & BUSINESS FED. INCOME TAX	$ 4,139,842,717	$ 21,561,681	1	22.50%	$ 4,139,842,717
COLLECTED FED. PAYROLL TAX	$ -	$ -	0	0.00%	$ 4,977,271,961
P3 PARTICIPATION	$ 1,380,000,000	$ 7,187,500	1	7.50%	
	$ 7,736,232,035	$ 53,723,834	ADVANCED & REPAID MONTHLY		
TIFIA, RRIF, FHWA BONDS - RETIRED BY OPERATIONS	$ 10,663,767,965	57.96%	1	35 YRS	$ 10,663,767,965
TIFIA & RRIF REVENUE BONDS RATE OF FINANCE (EST.)	3.00%		35	YEARS STAGGERED BONDS	
REVENUES & EXPENSES					
FARE PER MILE	$ 0.35		SAME AS 2019 PER-MILE MARTA		
AVERAGE TRIP FARE	$ 3.50				
ANNUAL FARE REVENUE 100% OPERATION	$ 1,410,482,385		SEE OPER. WORKSHEET (VARIES BY YEAR)		
OTHER OPERATING REVENUE	$ -				
LESS: BONDS PMT. (MAX. PAYMENTS YEARS)	$ 511,172,733		PAID BY PROJECT / OPERATING REVENUE		
LESS: OPERATIONS	$ -		SEE OPER. WORKSHEET (VARIES BY YEAR)		
ANNUAL RETURN TO SPONSOR	$ 76,947,009		WHILE BONDS ARE BEING RETIRED		
ANNUAL RETURN TO SPONSOR	$ 588,119,742		AFTER BONDS PAID OFF		

a. Table "P1-Sum": Table P1-Sum, above, summarizes the costs, income, ridership and debt that describe the results of the financial plan used for HighRoad transit.

TABLE P2 - FUNDS ATLANTA REGION HIGHROAD TRANSIT 372 MILES

CONSTRUCTION FUNDING

		$ 0.35	TRIP FARE FOR 1 MILE		$ 3.50	10.00	MILES / TRIP	BONDS		
			CHOOSE 1=ON OR 0=OFF	CHOOSE 1=ON OR 0=OFF	% SHARE TO BE SET BELOW	CHOOSE 1=ON OR 0=OFF		ALL BONDS TERM IN YEARS		ALL BONDS INTEREST RATE
		$18,400,000,000	1	1	7.50%	1		35		3.00%
YR	ANNUAL % OF PROJECT FUNDED	CURRENT YEAR CONSTRUCTION CASH NEEDED	BASIC FUNDS AVAILABLE FROM FEDERAL RECYCLED TAX SOURCES	BASIC FUNDS AVAILABLE FROM STATE RECYCLED TAX SOURCES	P3 AGREEMENT 50% OF PRE-TAX FEE	ANNUAL ADDED STAGGERED TIFIA, RRIF, FHWA CONSTRUCTION BONDS OR PRIVATE ACTIVITY BONDS	ANNUAL ADDED GRANTS ALL SOURCES	CASH AVAILABLE FOR CONSTRUCTION & START-UP	ANNUAL SURPLUS (SHORTFALL)	BONDS DEBT
1	5.00%	$ 920,000,000	$ 206,992,136	$ 110,819,466	$ 69,000,000	$ 533,188,398	$ -	$ 920,000,000	$ -	$ 533,188,398
2	6.00%	$ 1,104,000,000	$ 248,390,563	$ 132,983,359	$ 82,800,000	$ 639,826,078	$ -	$ 1,104,000,000	$ -	$ 1,173,014,476
3	6.00%	$ 1,104,000,000	$ 248,390,563	$ 132,983,359	$ 82,800,000	$ 639,826,078	$ -	$ 1,104,000,000	$ -	$ 1,812,840,554
4	6.00%	$ 1,104,000,000	$ 248,390,563	$ 132,983,359	$ 82,800,000	$ 639,826,078	$ -	$ 1,104,000,000	$ -	$ 2,452,666,632
5	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 3,145,811,550
6	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 3,838,956,467
7	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 4,532,101,385
8	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 5,225,246,303
9	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 5,918,391,221
10	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 6,611,536,138
11	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 7,304,681,056
12	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 7,997,825,974
13	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 8,690,970,891
14	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$ 9,384,115,809
15	6.50%	$ 1,196,000,000	$ 269,089,777	$ 144,065,306	$ 89,700,000	$ 693,144,918	$ -	$ 1,196,000,000	$ -	$10,077,260,727
16	5.50%	$ 1,012,000,000	$ 227,691,349	$ 121,901,412	$ 75,900,000	$ 586,507,238	$ -	$ 1,012,000,000	$ -	$10,663,767,965
	100.00%	$18,400,000,000	$4,139,842,717	###########	$ 1,380,000,000	$ 10,663,767,965	$ -	$18,400,000,000	$ -	
			RECYCLED TAX	RECOVERED	P3 AGREEMENT	BONDS	GRANTS	CASH AVAILABLE	SURPLUS	BONDS OUTSTANDING
			22.50%	12.05%	7.50%	57.96%	0.00%			57.96%

b. Table "P2-Funds": Table P2-Funds (see page above) describes the annual funds needed to complete a project and their sources, including state recycled tax funds, Federal recycled tax funds, P3 Contractor participation funds, and government funds from TIFIA, RRIF, and Private Activity Bonds, according to final project need and operating project ability to completely retire the bonds over 35 years according to FTA guidance.

c. Local Funding: – The local regional community, by action of its State of Georgia Legislature, has provided a law, HB-930 (2018), that authorizes a private company to combine its capabilities with local governments to create a transit system using local taxing authority if needed in addition to nonconventional financing methods and transit earnings to pay for all the costs of building, operating and maintaining the proposed system at no cost to any government other than the costs of administrative oversight. The funding plan includes a 1% of construction costs fee to cover these government costs that is provided-for in the previously-mentioned law.

d. PPP (P3) - Local Funding: (See letter below.) Support of limited funding from a PPP contractor as a local supporter of the project is a copy of a Corporate Resolution (presented on the following page) from a firm which is also a Lead Contractor. It shows the conditions required by the PPP contractor for use of its funds to assure the principal use for which it is intended, i.e., providing a public transit system of the nature and scope of service which existing government agencies are not currently providing or believed to be likely providing due to their rational awareness of the estimated lack of needed construction and operating funds.

e. Table "P3-Opns-Cash": Table P3-Opns-Cash (below) describes the annual cash flows that the project will manage in a balanced manner to assure that the project is built in a pattern that will provide transit services to match the planned addition of transit service over time, while maintaining the efficiency of a multi-year plan for designing, building, operating and maintaining the system while at the same time retiring all the bond financing that has been accumulated. Results of this process for this project is that all costs of construction will be covered as planned and that all debts will be retired as contracted. Funds not consumed by the project will be disbursed after assuring that all bond payments are met on time regardless of the at-risk earnings of the Operator or the Operator's contract fees for service.

CORPORATE PUBLIC-PRIVATE-PARTICIPATION RESOLUTION

Purpose: For Participation in financing of the Construction of the HighRoad Atlanta Region Transit System proposed by Owen Transit Group, Inc., thereby enabling the construction and operation of the transit system.

Participant: Owen Transit Group, Inc., a Georgia privately-held for-profit corporation, located at 481 S. Keeler Woods Drive Marietta, GA 30064.

I, William E. Owen, the undersigned President of the Corporation named above, HEREBY CERTIFY that the Corporation is organized and existing under and by virtue of the laws of the state of Georgia as a corporation for profit, with its principal offices at 481 South Keeler Woods Drive, Marietta, GA 30064.

I FURTHER CERTIFY that at a meeting of the Board of Directors of the Corporation, called as a special meeting for review and approval of the purpose as indicated above, held on October 16, 2021, at which a quorum was fully informed of the resolution and voting remotely, the following resolutions were adopted.

Resolved, that the Corporation named above agrees to participate in the financing of construction of the project as described above, the HighRoad Atlanta Region Transit System, not by a cash grant but by reducing its contemplated project fees (as submitted in cost estimates provided in a project proposal to the Federal Transit Administration) by an amount equal to one-half (50%) of the gross contemplated fees that would be received by the corporation as measured for each month during construction to assure that the cash flow of the construction work of the project is balanced, and that this is dependent on future Contracts to be established with the Corporation that may be entered into by a contracting agency of the STATE OF GEORGIA during the 18 years from 2022 to 2040 for construction of the HighRoad transit system defined by Owen Transit Group, Inc. in its Submittals to the Federal Transit Administration and

Resolved, that the participation cited above is to be concurrent with Guideway Mobility Group, Inc., the only organization licensed by Owen Transit Group, Inc for System Operations Management, being awarded by the State of Georgia through its official agencies all operations management contracts related to the same HighRoad transit system identified above as the HighRoad Atlanta Region Transit System for a period of 50 years from the date appearing below and the operations management contracts be compensated with an operator's fee of 5% of the fares and fare subsidies and a success fee of 15% of the fares and fare subsidies, and

Resolved that the work force of the System Operations Management team will be independently selected by Guideway Mobility Group, Inc.

William E. Owen — Oct. 16, 2021

William E. Owen, P.E.
President, Owen Transit Group, Inc.

Date:

TABLE P3 - OPNS-CASH ATL REGION HIGHROAD TRANSIT

OPERATIONS CASH FLOW 372 MILES

BONDS ANNUAL COST	MILES/ TRIP AVG.	RIDERS GROWTH RATE %	INP 1.E13 FARE PER MILE	DAILY RIDERS & ANNUAL INCOME	SUM.F5 RIDERS PER MILE	INTEREST ON DELAYED BONDS	$ 0.350 FARE / MILE 35-YEAR BONDS, ISSUED EACH YEAR		
3.00%	10.000	1.000	$ 0.350	1,104,096	3218	4.6539%		ANNUAL NET	
EACH BOND ANN. COST	PAX TRIPS PER DAY	PAX SHARE - START YEAR 4	DAILY FAREBOX REVENUE	ANNUAL OPERATING INCOME	BONDS PMTS & INTEREST BY YEAR (DELAYED)	ADDED DELAYED INTEREST BY YEAR	LESS: ANNUAL OPERATING COSTS - START IN YEAR 4	SYSTEM OPERATING MARGIN	YR
$ 24,814,210	0	0.000	$ -	$ -	$ -	$ -	$ -	$ -	1
$ 29,777,052	0	0.000	$ -	$ -	$ -	$ -	$ -	$ -	2
$ 29,777,052	0	0.000	$ -	$ -	$ -	$ -	$ -	$ -	3
$ 29,777,052	165,614	0.150	$ 579,650	$ 211,572,358	$ -	$ -	$ 123,354,396	$ 88,217,961	4
$ 32,258,473	276,024	0.250	$ 966,084	$ 352,620,596	$ 24,814,210	$ 744,426	$ 205,590,661	$ 121,471,299	5
$ 32,258,473	331,229	0.300	$1,159,301	$ 423,144,715	$ 54,591,263	$ 1,637,738	$ 246,708,793	$ 120,206,922	6
$ 32,258,473	386,434	0.350	$1,352,517	$ 493,668,835	$ 84,368,315	$ 2,531,049	$ 287,826,925	$ 118,942,545	7
$ 32,258,473	441,638	0.400	$1,545,734	$ 564,192,954	$ 114,145,368	$ 3,424,361	$ 328,945,057	$ 117,678,168	8
$ 32,258,473	552,048	0.500	$1,932,168	$ 705,241,192	$ 146,403,841	$ 4,392,115	$ 411,181,321	$ 143,263,915	9
$ 32,258,473	662,457	0.600	$2,318,601	$ 846,289,431	$ 178,662,314	$ 5,359,869	$ 493,417,585	$ 168,849,661	10
$ 32,258,473	772,867	0.700	$2,705,035	$ 987,337,669	$ 210,920,788	$ 6,327,624	$ 575,653,850	$ 194,435,408	11
$ 32,258,473	883,277	0.800	$3,091,468	$ 1,128,385,908	$ 243,179,261	$ 7,295,378	$ 657,890,114	$ 220,021,155	12
$ 32,258,473	993,686	0.900	$3,477,902	$ 1,269,434,146	$ 275,437,735	$ 8,263,132	$ 740,126,378	$ 245,606,901	13
$ 32,258,473	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 307,696,208	$ 9,230,886	$ 822,362,642	$ 271,192,648	14
$ 32,258,473	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 339,954,681	$ 10,198,640	$ 822,362,642	$ 237,966,420	15
$ 27,295,631	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 372,213,155	$ 11,166,395	$ 822,362,642	$ 204,740,192	16
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 404,471,628	$ 12,134,149	$ 822,362,642	$ 171,513,965	17
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 436,730,102	$ 13,101,903	$ 822,362,642	$ 138,287,737	18
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 468,988,575	$ 14,069,657	$ 822,362,642	$ 105,061,510	19
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	20
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	21
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	22
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	23
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	24
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	25
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	26
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	27
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	28
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	29
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	30
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	31
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	32
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	33
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	34
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	35
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	36
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	37
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	38
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 496,284,207	$ 14,888,526	$ 822,362,642	$ 76,947,009	39
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 468,988,575	$ 14,069,657	$ 822,362,642	$ 105,061,510	40
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 436,730,102	$ 13,101,903	$ 822,362,642	$ 138,287,737	41
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 404,471,628	$ 12,134,149	$ 822,362,642	$ 171,513,965	42
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 372,213,155	$ 11,166,395	$ 822,362,642	$ 204,740,192	43
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 339,954,681	$ 10,198,640	$ 822,362,642	$ 237,966,420	44
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 307,696,208	$ 9,230,886	$ 822,362,642	$ 271,192,648	45
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 275,437,735	$ 8,263,132	$ 822,362,642	$ 304,418,875	46
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 243,179,261	$ 7,295,378	$ 822,362,642	$ 337,645,103	47
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 210,920,788	$ 6,327,624	$ 822,362,642	$ 370,871,331	48
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 178,662,314	$ 5,359,869	$ 822,362,642	$ 404,097,558	49
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 146,403,841	$ 2,531,049	$ 822,362,642	$ 439,184,852	50
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 114,145,368	$ 1,637,738	$ 822,362,642	$ 472,336,637	51
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 84,368,315	$ 744,426	$ 822,362,642	$ 503,007,001	52
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 54,591,263	$ 1,637,738	$ 822,362,642	$ 531,890,741	53
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ 24,814,210	$ 744,426	$ 822,362,642	$ 562,561,105	54
	1,104,096	1.000	$3,864,335	$ 1,410,482,385	$ -		$ 822,362,642	$ 588,119,742	55
$ 496,284,207	RIDERS		DAILY FAREBOX REVENUE	ANNUAL INCOME	$ 17,171,433,547	$ 508,964,268	OPERATING COSTS BY YEAR	**TOTAL NET CASH TO PPP SPONSOR**	

f. Table "P4-Labor": Table P4-Labor describes the labor costs of the operations. Costs of current labor at current rates (Federal contract labor rates or higher) for all jobs needed in operations are summarized and expressed in cost per hour of operation for an average vehicle. Taxes and benefits are calculated and added into the summary. No jobs are included for reasons other than for providing transportation.

g. Table "P5-Opns.": Table P5-Opns. describes the total estimated cost of all known elements of operations.

h Table "P6-Needed": Table P6-Needed is used to calculate the number of vehicles and spare vehicles estimated to be needed for the completed system.

i. Table "P7-Congestion": Table P7-Congestion illustrates the means for calculating time of travel and delays incurred in driving an automobile through traffic-light-controlled intersections, using Civil Engineering Road Design and Management texts.

j. Table "P8-Uber": Table P8-Uber illustrates possible cash flows from using Uber-type (but not using only Uber company services) that will financially support first-mile / last-mile transportation needs of the public using HighRoad transit.

k. Table "P9-Man-Lanes": Table P9-Man-Lanes illustrates the relative effectiveness of using financial capital for building these managed lanes systems versus building a HighRoad system to accomplish better results.

l. Table "P10-Routes": Table P10-Routes illustrates potential corridor routes for HighRoad systems based on their ability (width & clearances) to embrace the HighRoad construction and the usefulness of their intercepting traffic from other jurisdictions as well as their closeness to large concentrations of citizens who are likely riders of the HighRoad, and their inclusion of all groups of people who in the past may have not received fair distribution of transit services while paying taxes while not receiving the services.

m. Table "P11-Taxes": Table P11-Taxes illustrates the economic movement of cash through a HighRoad construction project where taxes on personal expenditures are passed through several levels of earnings, taxation and collections and then re-supplied to the project as partial funding of the project. This economic recycling is the natural occurrence in all economies. Its rapid recycling of tax income with its eventual completion of the project and the final collection of the taxes supports 34.48% of the project, making it possible when combined with a PPP participation and bonds issued for the balance of 58.02%, and creating a 16-year project employing approximately 30,000 workers a year. Without recycling the project is not affordable from direct taxes for the project from the entire regional population as proposed by less-efficient system providers.

k. Table "P12-CBO": Table P12-CBO illustrates the economic movement of cash through a HighRoad construction project where taxes on construction project expenditures are "recycled" and recognized as immediately collected by the Federal Treasury, and then immediately loaned for a very short month for recycling of those taxes to be a catalyst for other funds to be loaned to the project for another very short monthly recycling period. The net result is that for only relatively small loans that are collected and repaid weekly

from payrolls and estimated tax business payments the entire project is enabled. Without it the project cannot succeed without collecting billions of dollars from the public and giving the funds to the project. In the period of the construction the Treasury will avoid grant expenditures of over $4.488 billion dollars and collect $9.88 billion dollars in tax revenue originating in the project.

l. Table "P13-Process": Table P13-Process describes the cash flow in the process of recycling taxes received only because of the existence of the project. It illustrates the "zero-cost" of the project to the state of Georgia and the United States Government/FTA. It is followed by a word description of the process and the financial summary of the recycled taxes process. Note that the recycled taxes through the Federal Government do not recycle any Social Security or Medicare taxes and these recycled funds are not used in the project. They are generated by the project and used only for payments of worker benefits.

(The above paragraphs relate to the following related tables.)

TABLE P4 - LABOR ATLANTA HIGHROAD 343-MILE SYSTEM

LABOR COSTS & OVERHEAD SUMMARY - OPERATIONS

LABOR COSTS (7 DAYS, 3 SHIFTS):	1=YES 0=NO	CSS ZONES 62 MILES	LINE QTY.	USA BASE RATE/YR	2021 ADJUSTED RATE/YR	ATLANTA WAGE RATE FACTOR	$/VEH. HOUR	ANNUAL COST WITH WAGE RATE FACTOR
ATTENDANT ON VEHICLES- 140 HRS/WK	0	0	0.0	$ 50,000	$ 50,000	1.00		$ -
BEAM MAINT. STAFF - 1 SHIFT - 7 DAYS	1	1	480.3	$ 70,000	$ 70,000	1.00	$ 9.59	$ 33,623,800
STATION MAINT. STAFF - 1 SHIFT - 7 DAYS	1	1	384.3	$ 40,000	$ 40,000	1.00	$ 4.38	$ 15,370,880
VEHICLE MAINT. STAFF - 1 SHIFT - 7 DAYS	1	1	303.7	$ 80,000	$ 80,000	1.00	$ 6.93	$ 24,292,926
SUPERVISORY STAFF	1	6.00	2.8	$ 100,000	$ 100,000	1.00	$ 0.48	$ 1,680,000
MANAGERIAL STAFF - SYSTEM & MAINT.	1	6.00	2.8	$ 120,000	$ 120,000	1.00	$ 0.57	$ 2,016,000
SECURITY STAFF	1	6.00	2.8	$ 60,000	$ 60,000	1.00	$ 0.29	$ 1,008,000
PUBLIC RELATIONS STAFF	1	6.00	1.0	$ 50,000	$ 50,000	1.00	$ 0.09	$ 300,000
FARE COLLECTIONS STAFF	1	6.00	2.8	$ 50,000	$ 50,000	1.00	$ 0.24	$ 840,000
FINANCIAL MGT. STAFF	1	6.00	2.0	$ 120,000	$ 120,000	1.00	$ 0.41	$ 1,440,000
CENTRAL SUPERVISORS (3 SHIFTS, 7 DAYS	1	6.00	10.5	$ 90,000	$ 90,000	1.00	$ 1.62	$ 5,670,000
ADMINISTRATIVE ASSISTANTS	1	6.00	1.0	$ 85,000	$ 85,000	1.00	$ 0.15	$ 510,000
ZONE GENERAL MANAGEMENT TEAM	1	6.00	2.0	$ 300,000	$ 300,000	1.00	$ 1.03	$ 3,600,000
GENERAL MANAGEMENT TEAM	1	1.00	2.0	$ 350,000	$ 350,000	1.00	$ 0.20	$ 700,000
TOTAL DIRECT LABOR PAYROLL			1,198				**$ 35.33**	$ 91,051,606
FRINGE BENEFITS FOR EMPLOYEES:		230	NET WORK DAYS / YEAR					
VACATION & SICK LEAVE & HOLIDAYS	10	10	10			11.74%	$ 5.63	$ 10,688,667
EMPLOYER FICA / RETIREMENT						7.65%	$ 3.67	$ 6,965,448
RETIREMENT						10.00%	$ 4.79	$ 9,105,161
WORKMAN'S COMP. INSUR.						5.00%	$ 2.40	$ 4,552,580
MEDICAL INSURANCE						17.00%	$ 8.15	$ 15,478,773
TOTAL LABOR BENEFITS						69.69%	**$ 24.63**	$ 46,790,629
TOTAL COST OF OPERATION:								
TOTAL GENERAL OVERHEAD (SEE "OPERATIONS")							**$ 360.26**	$ 684,520,408
DIRECT LABOR PAYROLL, ABOVE							**$ 35.33**	$ 91,051,606
LABOR BENEFITS, ABOVE							**$ 24.63**	$ 46,790,629
LABOR AND OVERHEAD GRAND TOTAL							**$ 420.22**	**$ 822,362,642**

TABLE P5 - OPER. OPERATING COSTS ATLANTA REGION HIGHROAD 343 MILES

343 MILE ATLANTA REGION TRANSIT HIGHROAD SYSTEM 2021

OPERATING COSTS AND GENERAL OVERHEAD

MILES IN SYSTEM	343.10		VACATION DAYS	10	
HOURS OF OPERATION	24		SICK LEAVE DAYS	10	
AVERAGE SPEED MPH	42.01		HOLIDAYS	7	
LOCATION COST FACTOR	1.00		TOTAL	27	
NUMBER OF VEHICLES	216.90				
PROPERTY TAX RATE	0.00%				
ANNUAL WORK DAYS	365		PASSENGERS PER DAY	1,104,096	
DAYS OF OPERATIONS / YR	365		FARE PER AVERAGE TRIP	$ 3.50	
NUMBER OF STATIONS	274		PASSENGERS PER YEAR	402,994,967	
VALUE OF STATIONS	$ 987,139,872		PASSENGERS / MILE / DAY	3,218	
VALUE OF VEHICLES	$ 881,415,292		MILES TRAVELED PER DAY	1,008	EACH VEHICLE
VALUE MAINT, ADM. & CSS EQUIP.	$ 14,724,000		MILES TRAVELED PER YEAR	79,818,520	ALL VEHICLES

GENERAL COSTS:		REF.	UNITS	BASIS $/UNIT	$/VEH. HOUR	ANNUAL COST
PROPERTY TAX			0.00%		$ -	$ -
UBER / COUNTY BUS LAST / FIRST MILE						$ -
PARATRANSIT ADA SERVICE				SEE BELOW	$ 14.95	$ 28,404,997
LIABILITY INSURANCE			1.00%	$ 1,883,279,164	$ 9.91	$ 18,832,792
BEAM & RAIL MAINTENANCE (1%)			1.00%	$ 1,151,004,166	$ 6.06	$ 11,510,042
VEHICLE MAINTENANCE & SPARES			5.00%	$ 881,415,292	$ 23.19	$ 44,070,765
BRAKES MAINTENANCE (EA. 40K MILES)		79,818,520	40,000	$ 2,000	$ 2.10	$ 3,990,926
VEHICLE REPLACEMENT (20 YRS) SL SF		1	5.00%	$ 881,415,292	$ 23.19	$ 44,070,765
STATION DEPRECIATION (30 YRS) SL SF		0	3.30%	$ 987,139,872	$ -	$ -
STATION & SERVICE BAYS MAINTENANCE			3.00%	$ 987,139,872	$ 15.59	$ 29,614,196
PUBLIC TRANSIT USE EDUCATION	5.00%	1,104,096	365	$ 3.50	$ 37.12	$ 70,524,119
VEHICLE ELEC. DEMAND (NOT BILLED)		1,200	0	$ -	$ -	$ -
VEHICLE ELEC. KW COSTS (AVG.)	0.746	50.00%	1200	$ 0.10	$ 44.76	$ 85,046,410
STATIONS DEMAND (NOT BILLED)		274	0	$ -	$ -	$ -
STATIONS KW COSTS		274	100	$ 0.10	$ 12.65	$ 24,044,448
OPERATIONS LICENSE FEE		1	15.00%	$ 1,410,482,385	$ 111.35	$ 211,572,358
SYSTEM OPERATOR AFTER EXPENSES		1	5.00%	$ 1,410,482,385	$ 37.12	$ 70,524,119
FARE CARD CHARGES			2.00%	$ 1,410,482,385	$ 14.85	$ 28,209,648
FARE CARD DATA COLLECTION & MANAGE			1.00%	$ 1,410,482,385	$ 7.42	$ 14,104,824
TOTAL GENERAL AND OVERHEAD:					**$ 360.26**	$ 684,520,408
WITH LOCATION COST FACTOR:				1.00	**$ 360.26**	$ 684,520,408

NOTE: BOARDING STATIONS, ADMINISTRATION AND MAINTENANCE ARE ALL WITHIN HIGHROAD STATION BUILDINGS.

PARATRANSIT

REGARDING MARTA PARATRANSIT OPERATIONS - BASED ON 2017 FTA PARATRANSIT RIDERS DATA

APTA - FTA MARTA COST 47.6 MILES	PARA SHARE	PAX/YR	$/PAX		
$ 34,241,000	1.01%	687,537	$ 49.80	$ 7.1146	per mile MARTA round trip
MARTA AVG. ROUND TRIP MILES (FTA)		13.59	$ 5.00	$ 0.36	per mile MARTA FARE
COST PER PARATRANSIT TRIP, NET	IF PAX PAYS BASE FARE		$ 44.80	68,280,860	TOTAL TRIPS MARTA RAIL / YR

REGARDING HIGHROAD PARATRANSIT OPERATIONS - BASED ON 2021 OTG ESTIMATE

HIGHROAD ESTIMATED COST 365 MILES	PARA SHARE	PAX/YR	$/PAX		
$ 28,404,997	1.01%	4,057,857		$ 2.00	per pax trip UBER HR PAYS
HIGHROAD AVG. ROUND TRIP		20.00	$ 7.00	$ 0.35	per mile HIGHROAD FARE
COST PER PARATRANSIT TRIP, NET	IF PAX PAYS BASE FARE		$ 7.00	402,994,967	TOTAL TRIPS HIGHROAD / YR

TABLE P6- 343-MILE ATL REGION TRANSIT HIGHROAD SYSTEM 2021 VEHICLE REQUIREMENTS, INPUTS & RESULTS	
TOTAL VEHICLES NEEDED IN SYSTEM	216.90
DESIGN PASSENGERS PER DAY	1,104,096
DIRECTIONS OF SERVICE	2
VEHICLE CALCULATED AVERAGE SPEED, INCLUDING DWELL, MPH	42.01
PERCENT OF DAILY PASSENGERS AT PEAK HOURS	0.12
PASSENGERS CARRIED PER VEHICLE	150
CALCULATED NUMBER OF VEHICLES REQUIRED	210.26
STANDBY VEHICLES (SEE INPUT 1 LINE E31)	6.64

TABLE P7 - TRAFFIC CONGESTION PREDICTION PER AASHTO & BECHTEL			
THROUGHPUT, VELOCITY AND TIME ANALYSIS			
Total trip length	10	Miles	
Traffic light period at 50% dwell	90	Seconds	With Turn Lanes
Design Acceleration - Deceleration	3.2	FT/SEC/SEC	
Auto Cruise MPH	45	MPH	
Auto Cruise FPS	66	FPS	
Time to accelerate to Cruise MPH	14.0625	Seconds	
Traffic light average Sepraration	5280	Feet	1 Mile
Acceleration + Deceleration Distance	632.813	Ft.	
Auto Cruise Distance	4647.19	Ft.	
Auto Cruise Time:	70.4119	Sec.	
Acceleration +Deceleration Time	28.125	Sec.	
Avg. Dwell at Traffic Light (1 per mile)	90	Sec.	
TOTAL LIGHT-TO-LIGHT TIME	188.537	Sec.	
Automobiles Gap, feet per 10 mph	20	Feet	Vehic. avg. lgth
Safe Distance Between Autos at Cruise	90	Ft.	
Peak Autos Per Lane Per Hour:	1,120.2	Autos	Per AASHTO
Peak Autos Per 2 Lanes Per Hour:	2,240.4	Autos	Per AASHTO
Peak Autos Per Rush Hour Bechtel	12%	%	
Total Autos per 24 hrs. Bechtel 12%:	18,670.1	Autos	Per Bechtel
Automobile Average Speed:	19.0944	MPH	(Ft/Sec)/88)*60
Automobile Trip Time, 10 Miles:	31.4228	Minutes	
HighRoad trip time, 10 Miles	15	Minutes	@ 40 mph Avg.
Auto Light-to-Light Time W/ 1/2 Dwell:	94.2685	Seconds	50% Probability

ANALYSIS OF THE ABOVE TABLE:

1. EACH LANE HAS A PHYSICAL LIMITATION OF CARS MOVING IN THE LANE. (AASHTO POLICY MANUAL).

2. BY INCREASING THE SPEED OF THE TRAFFIC THE THROUGHPUT INCREASES, ALTHOUGH DRIVERS WILL INCREASE GAPS FOR SAFETY, SLOWING AND EQUALIZING THROUGHPUT . (AASHTO POLICY MANUAL).

3. THEREFORE, BY BUILDING HIGHROAD, THE AUTOMOBILE DRIVERS WILL HAVE A MUCH BETTER OPTION FOR TRAVEL, SAVING 50% OF TIME WITH HIGHROAD AND MONEY FOR TRANSPORTATION AND REDUCING STRESS TWICE A DAY. ADDITIONALLY, HIGHROAD CAN HELP OPEN UP THE ROADS FOR FASTER AUTOMOBILE TRAVEL.

TABLE P8- UBER ATLANTA REGION HIGHROAD 343-MILE SYSTEM

STATION UBER ANALYSIS - WITH DRIVERS

HIGHROAD:		
DAILY RIDERSHIP, AVERAGE STATION		3,750
RIDER INCREASE DUE TO UBER AVAILABLE %		10.00%
RIDERS ADDED		375
FARE $ / ADDED RIDER	$	3.50
ADDED $ / DAY	$	1,313
GAIN TO HR SYSTEM / DAY	$	750
GAIN TO HR SYSTEM / YR BEFORE FREE UBER COSTS	$	273,750
COST OF $2 RIDES TO HIGHROAD / YEAR	$	273,750
NET COST / STATION TO SPONSOR UBER RIDERS	$	-

INFORMATION FOR THE UBER DRIVER

UBER & LYFT OR OTHER, "UBER"		
UBER FARE PAID BY EACH ONE-WAY RIDER	$	1.00
HR PAYS FOR EACH RIDER ONE-WAY TRIP, OUT OR BACK	$	1.50
HIGHROAD RIDERS PER CAR, ROUND TRIP, AVERAGE		1.50
CAR INCOME EACH ROUND TRIP	$	7.50
4-MILE ROUND TRIPS / HR @ 15 MIN / ROUND TRIP		4
UBER SERVICE GROSS / HOUR	$	30.00
LESS: 4 MILES / TRIP @ $0.55 PER MILE COST / HR	$	8.80
NET FOR DRIVER & UBER	$	21.20
PAY PER HOUR FOR DRIVER	$	15.00
NET GROSS HOURLY INCOME FOR UBER	$	6.20
(NOTE: DRIVER CAN EARN TIPS; UBER EARNS W/MORE AVG PAX)		

INFORMATION FOR THE UBER COMPANY

UBER GROSS INCOME FROM UBER DRIVER 1 YR	$	12,400
UBER VEHICLE & LIABILITY INSURANCE	$	4,000
UBER EMPLOYER TAX	$	4,590
UBER INC. NET FOR 1 CAR & DRIVER	$	3,810
UBER NET/YR / 240 STATIONS AFTER DRIVER TAX, 2 SHIFTS	$	1,828,800

DRIVER PAYS OWN MEDICAL COSTS, UBER INC. PAYS EMPLOYER TAX

UBER TO GUARANTEE VEHICLE AVAILABILITY WITHIN 8 MINUTES.

NOTE: AS RIDERSHIP CHANGES FOR UBER, HIGHROAD INCOME OFFSETS.

STATION UBER ANALYSIS - AUTONOMOUS VEHICLES

HIGHROAD:		
DAILY RIDERSHIP, AVERAGE STATION		3,750
RIDERS INCREASED DUE TO UBER AVAILABLE %		10.00%
RIDERS ADDED		375
FARE $ / ADDED RIDER	$	3.50
ADDED $ / DAY	$	1,313
GAIN TO HR SYSTEM / DAY 2 DIRECTIONS	$	750
GAIN TO HR SYSTEM / YR BEFORE FREE UBER COSTS	$	273,750
COST OF $2 RIDES TO HIGHROAD / YEAR	$	273,750
NET COST / STATION TO SPONSOR UBER RIDERS	$	-

INFORMATION FOR THE UBER DRIVER

UBER & LYFT OR OTHER, "UBER"		
UBER FARE PAID BY EACH ONE-WAY RIDER	$	1.00
HR PAYS FOR EACH RIDER ONE-WAY TRIP, OUT OR BACK	$	1.50
HIGHROAD RIDERS PER CAR, ROUND TRIP, AVERAGE		1.50
CAR INCOME EACH ROUND TRIP	$	7.50
4-MILE ROUND TRIPS / HR @ 15 MIN / ROUND TRIP		4
UBER VEHICLE GROSS / HOUR	$	30.00
LESS: 4 MILES / TRIP @ $0.55 PER MILE COST / HR	$	8.80
NET FOR AUTOMATED UBER	$	21.20
NET GROSS HOURLY INCOME FOR UBER	$	21.20
(NOTE: UBER EARNS W/MORE AVG PAX)		

INFORMATION FOR THE UBER COMPANY

UBER GROSS INCOME FROM UBER AUTOM. VEHICLE 1 YR	$	42,400
UBER VEHICLE & LIABILITY INSURANCE	$	10,000
UBER EMPLOYER TAX	$	-
UBER NET FOR 1 CAR	$	32,400
UBER NET/YR / 240 STATIONS AFTER DRIVER TAX, 2 SHIFTS	$	15,552,000

UBER TO GUARANTEE VEHICLE AVAILABILITY WITHIN 8 MINUTES.

NOTE: AS RIDERSHIP CHANGES FOR UBER, HIGHROAD INCOME OFFSETS.

TABLE P9 - MANAGED LANES COMPARED TO HIGHROAD TRANSIT

FEDERAL FUNDING BY REDIRECTING GRANTS FOR THE ATLANTA REGIONAL HIGHROAD PROJECT

ROADS CONSTRUCTION SERVICE COMPARED TO HIGHROAD TRANSIT

HIGHROAD		NEW 2 MANAGED LANES HIGHWAY	
HIGHROAD MILES	343	HIGHWAY MILES	343
LANES	2	LANES	2
LANE MILES	686	LANE MILES	686
PEAK HOUR SHARE OF DAILY TOTAL	12.00%	PEAK HOUR SHARE OF DAILY TOTAL	12.00%
ADDED VEHICLES CAPACITY GROWTH	1000%	ADDED AUTOMOBILE CAPACITY GROWTH	0%
MILES / PASSENGER TRIP	10	MILES PER PASSENGER TRIP	10
PASSENGERS / VEHICLE	150	PASSENGERS / VEHICLE	1.2
VEHICLES / HOUR / LANE @ 4.5 MIN	13.3	VEHICLES / HOUR / LANE AT MAX	1,000
STARTING PASSENGERS / LANE / HR	1,995	STARTING / FINAL PAX / LANE / HOUR	1,200
STARTING PASSENGERS / HR 2 DIR	3,990	STARTING & FINAL PAX TRIPS / HOUR 2 DIR	2,400
STARTING DAILY PEAK USAGE / DAY	1,104,096	STARTING DAILY PEAK USAGE / DAY	686,000
ULTIMATE DAILY PEAK USAGE / DAY	11,040,958	ULTIMATE DAILY PEAK USAGE / DAY	686,000
SPEED OF TRIP, MPH, AVERAGE	40	SPEED OF TRIP, MPH, AVERAGE	70
SUMMARY:		SUMMARY:	
COST OF 1 MILE OF HIGHROAD 3 LANES	$ 55,890,411	COST OF 1 MILE OF 2 MANAGED LANES	$ 28,523,490
COST OF 372 MILES OF HIGHROAD	$20,400,000,000	COST OF 343 MILES OF MANAGED LANES	$ 14,675,335,570
COST OF 10X CAPACITY	$20,400,000,000	COST OF 10X CAPACITY	$ 146,753,355,705
	(Bllions)		(Billions)

NET RESULT: HIGHROAD PAYS FOR ITSELF AND INCLUDES GROWTH POTENTIAL BY A FACTOR OF 7 TIMES.

THE FHWA CAN SAVE MULTIPLES OF BILLIONS OF DOLLARS THAT WON'T BE SPENT TRYING TO KEEP UP WITH THE NEED WHILE HIGHROAD CAN CONTINUE TO MEET THE NEED THROUGH THE END OF THIS CENTURY. AND HIGHROAD WON'T NEED TO CONDEMN LAND AND DISRUPT TRAFFIC WHILE BUILDING ITS INCREASED CAPACITY.

NOTE 1: MANAGED LANES COST BASED ON GDOT COST OF 2-LANES OF NORTHWEST CORRIDOR, ATLANTA I-75.

NOTE 2: HIGHROAD COST BASED ON OTG, INC. ESTIMATE.

NOTE 3: REGIONAL RIDERSHIP ESTIMATE BASED ON ATLANTA REGIONAL COMMISSION POPULATION GROWTH 2015-2040.

TABLE P10 - FIFTEEN-COUNTY & AACIDS HIGHROAD MILES & ROUTES

COUNTY DATA			COUNTY ROUTE SUGGESTIONS BASED ON TRAFFIC CONGESTION ESTIMATES					Miles based on 2019 "fair" share plus AACID Hub miles.
		343.00						
COUNTY	2020 POP.	2040 MILES SHARE						
FULTON	1,037,070	5.74%	Sandy Springs - Alpharetta (US-19)	Alpharetta - Cumming (US-19)	Clifton Rd - E.U. - Decatur (via rail & Clifton Rd)	Ben Hill - East Point (via Lankford Pky)	East Cobb - Roswell (Ros. Rd. & US-19)	19.7
AACIDS	In Fulton & Clayton		College Pk - Airport Hub (via AACID Loop)	15 MILE ROUTE IS INCLUDED IN MILES OF FULTON, CLAYTON, FAYETTE AND HENRY COUNTIES = 4% OF TOTAL				
GWINNETT	925,800	20.52%	Doraville to Duluth (US 23 Buford Hwy)	Decatur - Lawrenceville (via US-29)	Duluth - Buford (via US-23 Buford Hwy)	Duluth - Alpharetta (via GA-120)	Lawrenceville - Loganville (via Gwin-20)	70.4
COBB	766,400	17.32%	Acworth - Cumb. CID (Cobb Pky, S.Cobb Dr, Spr. St)	Marietta - Pow. Sprs (Powder Sprs. Rd)	Marietta - Holly Springs (GA 5 Canton Hwy)	Marietta - River (via Roswell Rd - J. Frry Rd)	Cumb. - Pow. Sprs. (Cumb. Pky - EW Conn)	59.4
DEKALB	753,030	12.42%	Decatur - Conyers (via us-278 & I-24)	Decatur - Tucker (via US-29)				42.6
CLAYTON	283,900	6.24%	AACID - Riverdale (via Godby Rd. & GA 139)	Fairburn HSR to P'tree City (via County-74)				21.4
CHEROKEE	262,700	5.39%	Holly Springs - Canton (via GA 5 Canton Rd & I-575)					18.5
HENRY	240,900	5.36%	Forest Pk HSR to Stockbridge (via US-41)					18.4
FORSYTH	221,019	5.16%	Alpharetta - Cumming (via US 19 & GA 400)					17.7
HALL	202,148	4.72%	Duluth - Gainesville HSR (via US-19)					16.2
DOUGLAS	144,900	3.24%	Douglasville - Austell (via US-78)	Lithia Sprs - Atl. Ind. Pk (via Thornton Rd.)				11.1
PAULDING	155,825	3.47%	Dallas - Powder Springs (US-278)					11.9
COWETA	140,526	3.29%	College Pk. HSR - Newnan (via US-19)					11.3
FAYETTE	118,000	2.62%	HSR Riverdale - Fayetteville (via GA 314)					9.0
BARTOW	103,807	2.39%	Acworth - Cartersville (via US 41)					8.2
ROCKDALE	95,700	2.13%	Decatur - Conyers (via us-278 & I-24)					7.3
TOTALS	5,451,725	100.03%						343.1

TABLE P11 - ATL REGION HIGHROAD TRANSIT 343 MILES

TAXABLE NET INCOME BASIS	62.60%

STATE & FEDERAL PERSONAL & BUSINESS TAX REVENUE - DURING CONSTRUCTION BASED ON 2020 GEORGIA & FEDERAL TAX RATES

STATE & FEDERAL TAX REVENUE FROM BUSINESS OPERATION

	STATE	STATE	FEDERAL	FEDERAL	STATE	FEDERAL
% OF NET SPENDABLE	5.75%	4.00%	12.00%	15.30%	5.00%	25.00%
WORKER INCOME	PERSONAL STATE INCOME TAX RECYCLED	STATE SALES TAX (INCREASES FROM MORE SALES) RECYCLED	PERSONAL FEDERAL INCOME TAX RECYCLED	TOTAL EMPLOYEE & EMPLOYER FEDERAL PAYROLL TAX (NOT RECYCLED)	STATE BUSINESS INCOME TAX BASED ON 10% PROFIT 12 YRS RECYCLED	FEDERAL TAXES ON 10% PROFIT RECYCLED
START-UP CASH	$ -	$ -	$ -	$ -	$ -	$ -
DESIGN	$ 38,761,686	$ 26,964,651	$ 80,893,954	$ 164,760,050	$ 7,179,087	$ 250,452,716
BUILD	$ 241,603,220	$ 168,071,805	$ 504,215,415	$ 1,026,956,317	$ 50,090,543	$ 250,452,716
VEHICLES	$ 22,074,960	$ 15,356,494	$ 46,069,482	$ 93,831,613	$ 4,576,705	$ 22,883,527
MANAGE	$ 21,578,103	$ 15,010,854	$ 45,032,562	$ 91,719,675	$ 3,996,500	$ 19,982,500
OVERHEAD	$ 141,963,497	$ 98,757,216	$ 296,271,647	$ 603,428,674	$ 26,293,188	$ 131,465,942
WORKER TOTAL	$ 465,981,466	$ 324,161,020	$ 972,483,060	$ 1,980,696,329	$ 92,136,024	$ 675,237,401
E47 INDUCED JOBS	$ 704,978,697	$ 490,419,963	$ 1,471,259,889	$ 2,996,575,652	$ 139,391,669	$ 1,021,559,906
GOVERNMENT TOTALS	$ 1,170,960,163	$ 814,580,983	$ 2,443,742,949	$ 4,977,271,981	$ 231,527,693	$ 1,696,797,307

	RECYCLED TAXES
WORKER TOTAL	$2,529,998,971
E47 INDUCED JOBS	$3,827,610,123
TOTAL	$6,357,609,095

Note: Federal Tax rates from 2019 Estimated Federal Income Tax table

EMPLOYEE SPENDABLE INCOME CALCULATION

DEDUCTIONS NAMES	DEDUCTIONS % FROM INCOME	NET SPENDABLE & TAXABLE %	BASIC PROJECT TAXES COLLECTED WITH INDUCED JOBS RECYCLED	SOURCE OF TAX REVENUE TO GOVERNMENTS
SALARY	-	100.00%		
LESS: GROSS DEDUCTIONS	10.000%	90.00%		
LESS: APPROVED SAVINGS	2.000%	88.00%	$ 1,985,541,146	STATE PERSONAL
LESS: FED. TAX -ESTIMATE	12.000%	76.00%	$ 7,421,014,930	FEDERAL PERSONAL
LESS: STATE TAX ESTIMATE	5.750%	70.25%	$ 231,527,693	STATE BUSINESS
LESS: PAYROLL TAX	7.650%	62.60%	$ 1,696,797,307	FEDERAL BUSINESS
TOTALS	37.400%	62.60%	$ 11,334,881,076	TOTAL TAXES

ANALYSIS OF INDUCED JOBS FACTORS ADDED TO BASIC TAXES

TAX RATE LEVEL	TAX COLLECTED CBRE LEVELS	
CBRE BASE LEVEL	100.00%	BASIC TAXES ON LABOR & BUSINESSES
CBRE LEVEL 1	62.60%	TAXABLE TAXES PASSED - THROUGH TO JOBS CREATED AND WORKERS EMPLOYED BY STAGES
CBRE LEVEL 2	39.19%	
CBRE LEVEL 3	24.53%	
CBRE LEVEL 4	15.36%	
CBRE LEVEL 5	9.61%	
	151%	

Note: CBRE Consultants, Inc. factors shown as used in University of San Diego study. The study was to determine the impact on the region and its governments due to economic effects of employees and students at the university.

TABLE P12-CBO - OTG, INC. SPONSORED ATLANTA REGION HIGHROAD TRANSIT

ANALYSIS OF FEDERAL NET CASH FLOW FROM THE ATLANTA HIGHROAD PROJECT CONSTRUCTION (AMOUNTS FROM WORKSHEET "P11-TAXES" AND "P-1 SUM")

CASH SOURCE (PAYROLL TAXES ARE ON DIRECT AND INDUCED EMPLOYEES)	PROJECT FUNDING	REPEATING INTEREST	NET SAVINGS TO TREASURY	CASH PROVIDED
GEORGIA RECYCLED LOANS FROM RECYCLED TAXES	$ 2,216,389,318			12.05%
FEDERAL RECYCLED PERSONAL INCOME TAX	$ 2,443,742,949	$ 2,036,452	$ 2,441,706,497	13.28%
FEDERAL RECYCLED BUSINESS INCOME TAX	$ 1,696,797,307	$ 1,413,998	$ 1,695,383,309	9.22%
FEDERAL PAYROLL TAX (NOT RECYCLED)		$ -	$ 2,488,635,981	
FEDERAL PAYROLL TAX (NOT RECYCLED)		$ -	$ 2,488,635,981	
PPP PARTICIPATION GRANT FROM CONTRACTOR	$ 1,380,000,000	$ -		7.50%
INFRA & RRIF FEDERAL LOAN GUARANTEES OF REVENUE BONDS	$ 10,663,767,965	$ -		57.95%
	$ 18,400,697,539	$ 3,450,450	$ 9,110,911,316	100.00%
ALTERNATIVE FEDERAL GRANTS NEEDED TO BE PAID, STARTING IMMEDIATELY IF HIGHROAD PROPOSAL NOT ACCEPTED:				
TREASURY AV0IDS MANAGED LANES 22% GRANTS OF COSTS AND SAVES $4.488 BILLION IF HIGHROAD APPROVED:			$ 4,488,000,000	
TAXES PAID ON NET SAVINGS FROM NOT OPERATING A CAR: (BASED ON 1,220,450 PASSENGERS / DAY AT $500.00 PER YEAR, AT A FEDERAL TAX RATE OF 12% PLUS 15.3% PAYROLL TAX TO TREASURY)			$ 166,576,410	
NET DIFFERENCE IN FAVOR OF TREASURY OF HIGHROAD APPROVED:			**$14,534,541,728**	

ONE MONTH INTEREST ON ONE MONTH OF FUNDING 16 YEARS @ 1% RATE = **$3,734,424 16 YEAR** NET COST TO TREASURY.

1 : FUNDS ADVANCED AND RETURNED THROUGH NORMAL COLLECTION PROCESSES ARE A REASONABLE METHOD OF FINANCING AN INFRASTRUCTURE PROJECT, AND INCUR NO BURDEN ON THE NATION OR A STATE.

2: THE PROJECT WILL PAY FOR EMPLOYMENT TAXES AND PROVIDE ADDITIONAL GNP TO THE NATION.

3: THE PROJECT WILL PROVIDE 30,000 AMERICAN JOB-YEARS EACH YEAR FOR 16 YEARS.

4: WITHOUT THE HIGHROAD FUNDING PLAN IT IS HIGHLY LIKELY THAT THE PROJECT WILL NEVER BE BUILT.

OTG, INC. SPONSORED ATLANTA REGION HIGHROAD TRANSIT

TABLE P13 - RECYCLING: PATHS OF CASH DURING RECYCLING FOR ONE YEAR

GEORGIA INITIAL YEAR OF LOANS			FEDERAL INITIAL YEAR OF LOANS		
MONTHLY LOAN TO PROJECT	MONTHLY REPAID THROUGH TAXES	MONTHLY AND ANNUAL NET COST	MONTHLY LOAN TO PROJECT	MONTHLY REPAID THROUGH TAXES	MONTHLY AND ANNUAL NET COST
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
$ 11,543,694	$ 11,543,694	$ -	$ 21,561,681	$ 21,561,681	$ -
		$ -			$ -

MONTHLY AND ANNUAL RECYCLED GRANTS WILL VARY MONTHLY ACCORDING TO EXPECTED CONSTRUCTION COSTS.

THIS PROCESS REPEATS MONTHLY UNTIL THE PROJECT IS COMPLETED.

NET COST TO THE STATE OF GEORGIA IS ZERO; NET COST TO THE FEDERAL GOVERNMENT IS ZERO.

	TABLE P14 - TRAFFIC SHARE LIKELY TO MOVE TO HIGHROAD - ATLANTA AS BASIS			
	CONGESTION WITH 9.75% OF POPULATION USING (BASED ON CONGESTED ATLANTA ACTUALS)			
	SEE RIDERSHIP WORKBOOK, TABLE R1 - ATLANTA			
1	LANES TWO DIRECTIONS -	2	4	6
2	PEAK HOURS / DAY	4	4	4
3	NON-PEAK HOURS / DAY	20	20	20
4	SHARE OF EACH PEAK HOUR	12%	12%	12%
5	SHARE OF EACH OFF-PEAK HR. AVG.	2.60%	2.60%	2.60%
6	CARS PER LANE PER HOUR	1,120	1,120	1,120
7	CARS PER PEAK HOUR MAXIMUM	2,240	4,480	6,720
8	PEOPLE / CAR MAXIMUM	1.2	1.2	1.2
9	PEOPLE / ROADWAY PER HOUR	2,688	5,376	8,064
10	PEOPLE / DAY ON 1 MILE ROAD (W/O HIGHROAD)	22,400	44,800	67,200
11	MILES OF TRIP PER PASSENGER	10	10	10
12				
13	BOARDING PEOPLE / DAY ON RAIL IF ATLANTA	19.838%	19.838%	19.838%
14	MARTA AVERAGE BOARDING DAILY RIDERS 2019	5,468	5,468	5,468
15	HIGHROAD PROFITABLE RIDERSHIP / MILE	3,218	3,218	3,218
16	DAILY RIDERS ON 1 MILE OF HIGHROAD	4,444	8,887	13,331
17	DAILY RIDERS ON 10 MILES OF HIGHROAD	44,437	88,874	133,311
18				
19	MILES OF HIGHROAD SYSTEM SUPPORTED	13.81	27.62	41.43
20				

ANALYSIS OF THE ABOVE TABLE:

1. EACH LANE HAS A PHYSICAL LIMITATION OF CARS MOVING IN THE LANE AT 45 MPH. (AASHTO POLICY MANUAL).

2. BY DIVERTING ROADWAY TRAFFIC BY 19.838% TO HIGHROAD, RIDERS ARE SERVED COMPARABLY BY HIGHROAD, THEIR COSTS ARE REDUCED, AND THE ROADWAYS ARE FREED-UP FOR MORE AND FASTER AUTO TRAFFIC, AND COUNTIES & CITIES SAVE ROADWAY MONEY.

3. THEREFORE, BY BUILDING HIGHROAD, THE AUTOMOBILE DRIVERS WILL HAVE A MUCH BETTER OPTION FOR TRAVEL, SAVING 50% OF TIME WITH HIGHROAD AND MONEY FOR TRANSPORTATION AND REDUCING STRESS TWICE A DAY.

II. New Starts

A. FTA approval; Project Development:

1. Project Status: The project is well-advanced with the following being completed or essentially completed and ready for the project to proceed to the next stage. Please see the OTG responses in Part A. Section **I. Discretionary & Competitive Federal Grant Program** funding and supporting pages that follow. Attention again is requested to be addressed to Excel Workbook B. Project Tables P1-P5.

   a. Specifications: These are completed project documents that define in detail the work to be constructed. A full and complete set of the Specification documents in Word (pdf) format is attached, as listed below by title. The full documents in PDF format are listed below and at the end of this submittal.

   Excel Workbook C. Controls
   Excel Workbook D. Drive Units
   Excel Workbook F. Fare
   Excel Workbook G. Guideway
   Excel Workbook O. Operations
   Excel Workbook P. Power Bars
   Excel Workbook Q. Routes Planning
   Excel Workbook R. Rails
   Excel Workbook S. Stations
   Excel Workbook V. Vehicle

2. Complete Environmental Review: This process has been completed at this time and is included in Part B. meeting the requirements of section **I. Approval Process & Data Submitted.**

   a. Locally Preferred Alternatives: A worksheet chart of that name is attached as a PDF in **Excel Workbook R. Ridership -** Table R7 Modes and shows critical decision choice data showing HighRoad being the logically-preferred first choice. This Table is also presented in this Submittal under Excel Workbook, R. Ridership as Tables 1 – 10.

   b. LPA Selection Process: The LPA selection process is one in which each political unit (State Authority, or County or District) has input to the MPO for the region, the Atlanta Regional Commission (ARC). In the Atlanta region the Atlanta Transit-Link Authority (ATL) in this case, will make its selections of technology, preferred routes and preferred Operator under the applicable law, can override any county's choices given to the MPO in the name of uniformity of system technology and operation HB-930 (2018) and submit them to the MPO for its use in its Comprehensive Transportation Plan (CTP) updated document and add them to its Concept 3 Plan, modify them according to the Laws in effect and refer them to the regional sponsor, the Atlanta Transit-Link Authority (ATL) for final approval and decisions on actions to be taken regarding the proposed transit system.

c. LPA Technology Candidates: A listing of the likely LPA technology candidates is below. They are shown in more detail with relevant cost and performance data in **Excel Workbook R. Ridership** -Table R7.

(1) HighRoad Elevated Guideway Heavy Rail
(2) Heavy Rail
(3) Light Rail
(4) Bus Rapid Transit (BRT), Arterial Buses, Buses
(5) Private automobiles
(6) Pods

The following were not included in the table since they are not sufficiently supported by governments as sufficient to the needs of the communities as principal transportation options.

(7) Maglev
(8) Taxicabs
(9) Autonomous automobiles
(10) Autonomous Buses (all uses)
(11) Uber & Lyft-type services
(12) Bicycles / Motorcycles / Scooters

The Operator candidates are shown on page 42.

d. Selecting Locally Preferred Alternative (LPA):

(1) LPA Present Selections: ATL Authority and County Selections of Technology and Operator options in above (1) through (12) added to the ARC Concept 3 Plan is unknown at this time while their political processes of annual Comprehensive Transportation Planning are being prepared.

B. FTA APPROVAL: SELECTION PROCESS

1. Selection process for preferred operator from the following options:

a. Guideway Mobility Group, Inc.: Officers of GMG, (Guideway Mobility Group, Inc., a Licensee from OTG, Inc., Licensor), are most familiar with HighRoad technology and operations planning during years as HighRoad officers, being system designers, construction finance plan designer, business plan originator and team members.

b. MARTA: MARTA has an operating history of very high operating costs, and is unlikely to provide funds for retirement of bonds or covering estimated HighRoad operating costs, and has no history of operations with HighRoad technology. MARTA is not licensed to operate a HighRoad system. However, with HighRoad licensing MARTA will agree to abide by the business plan prescribed by OTG.

c. GRTA (Georgia Regional Transportation Authority): GRTA's history is primarily with bus operations, and has none with HighRoad. GRTA is not licensed to operate a HighRoad system.

d. Atlanta Transit-Link Authority (ATL Authority): ATL has legal authority to select an operator, but is not licensed to operate a HighRoad system.

e. County Department of Transportation: Most counties in the region have experience in operating some buses (some with larger systems than others) but no history of operations with HighRoad technology or any type of rail technology. No county or district is licensed to operate a HighRoad system.

2. Adopting it into the fiscally constrained long- range transportation plan:

a. ARC Adoption into CTP: Each county in the Atlanta region is submitting a county-prepared Comprehensive Transit Plan for 2040 (prepared in 2021) as an official submittal to the Atlanta Regional Commission (ARC) for inclusion in the Concept 3 regional transportation plan and for other regional transportation planning activities. They are listed below by the calculated miles of guideway needed in the counties and region by 2040 from **Excel Workbook, R. Ridership** - Tables R1-R11. A present summary of the guideway mileage and status of each of the counties' CTP inclusion of this HighRoad project if they adopt HighRoad as their preferred major transportation system for the ARC Atlanta Region follows:

(1) DeKalb – 42.6 New miles
(2) Gwinnett – 70.4 New miles
(3) Cobb – 59.4 New miles
(4) Clayton– 21.4 New miles
(5) Atlanta Airport (AACIDs - 21 miles provided in adjacent counties' route miles)
(6) Fulton - 19.7 New miles
(7) Cherokee – 18.5 New miles
(8) Henry– 18.4 New miles
(9) Forsyth – 17.7 New miles
(10) Hall - 16.2 New miles
(11) Paulding – 11.9 New miles
(12) Coweta – 11.3 New miles
(13) Douglas – 11.1 New miles
(14) Fayette - 9.0 New miles
(15) Bartow – 8.2 New miles.
(16) Rockdale – 7.3 New miles

Total **343.1** New Miles

b. County CTP submittals: Each official submittal of a county-prepared Comprehensive Transportation Plan for 2040 (prepared in 2021) as an official submittal to the Atlanta Regional Commission (ARC) for inclusion in the Concept 3 Regional Transportation Plan and for other regional transportation planning activities is to be accepted by the ARC without objection. Such submittals will thereby qualify the submitting county as the Sponsor of the Plan for the county and are to be accepted by the ATL Authority as

Submittals for Review if the county is to participate as a joint financial sponsor of a regional HighRoad plan for heavy-capacity transit. Acceptance of HighRoad technology by the ARC is not known at this time, and the list below will be modified when participation is announced.

(1) DeKalb – Not proposed to county nor a decision provided to OTG at this time.
(2) Gwinnett – Not proposed to county nor a decision provided to OTG at this time.
(3) Cobb – Not proposed to county nor a decision provided to OTG at this time.
(4) Clayton– Not proposed to county nor a decision provided to OTG at this time.
(5) Fulton - Not proposed to county nor a decision provided to OTG at this time.
(6) Cherokee – Not proposed to county nor a decision provided to OTG at this time.
(7) Henry– Not proposed to county nor a decision provided to OTG at this time.
(8) Forsyth – Not proposed to county nor a decision provided to OTG at this time.
(9) Hall - Not proposed to county nor a decision provided to OTG at this time.
(10) Paulding – Not proposed to county nor a decision provided to OTG at this time.
(11) Coweta – Not proposed to county nor a decision provided to OTG at this time.
(12) Douglas – Not proposed to county nor a decision provided to OTG at this time.
(13) Fayette - Not proposed to county nor a decision provided to OTG at this time.
(14) Bartow – Not proposed to county nor a decision provided to OTG at this time.
(15) Rockdale – Not proposed to county nor a decision provided to OTG at this time.
(16) Airport (AACIDs) - Not proposed to county nor a decision provided to OTG at this time, but a decision is expected in 6 to 9 months after a sub-region study of technology proposals.

c. OTG Charges for Planning: OTG currently does not charge for the ridership and route planning services it provides to the region's counties since the services are part of an expanded regional marketing plan to establish HighRoad as the primary technology in the region. OTG does not receive any compensation for these services, nor do the counties make any assurances of acceptance of any OTG proposal. The services provided by OTG are for the purpose of informing counties of engineering facts and honest unbiased professional opinions of OTG management regarding transportation within the counties.

3. FTA evaluation, rating, and approval; Engineering:

a. Gain commitments of all non-5309 funding of competitive grants for small starts.

(1) Section 5309 funding. Because the Section 5309 funding is short-term lending with immediate payback to avoid systems' failing to provide small transit improvements when transit improvements are needed, and this is not a part of the HighRoad proposal, no commitments from this funding source are sought. Federal Government would have no costs to pay from taxes since they are only quickly-repaid loans made to the project. Section 5309 funding of competitive grants is not believed to be any part of the HighRoad Atlanta Transit Link System financing.

4. Complete sufficient engineering and design.

a. Completed engineering and design. All Specifications and design load Calculations have been completed to the extent that cost and personnel decisions for planning have been

completed. The Specifications and Calculations describe in great detail the process of design and construction of the system and can be used immediately for detailed cost estimates, bidding, contracting, financing, construction .and operation. Included in these Specifications is one covering the operations of the system when any part of it is completed. Examination of the Specifications will disclose details of design including force and power calculations, machinery, dimensions of parts, parts specifications, parts numbers and brands of selected construction components that represent well over 50% of the design of the system. Many standard system components are already designed and available "off-the-shelf" and ready for installation, while others have agreed to modify their standard products and systems to a point sufficient to establish final cost estimates of their areas of design and manufacture.

5. FTA evaluation, rating, and approval: Full Funding Grant Agreement:

a. Construction Team Selection: (Also applies to Operations Team)

(1) ATL Authority Selection Options: The ATL HB-930 Law in Article 2 states that the ATL Authority may make arrangements for design, construction and operation of a transit system with specified agencies "or with any private person, firm, or corporation, for those purposes, and to enter into contracts and agreements with the Georgia Department of Transportation, county and local governments, and transit system operators for those purposes;"

(2) Qualifications: Support of the OTG Team as the only approved construction team with brief business descriptions, capabilities, and operations management experience is supplied below. See below for more information on the capability of the team's Construction Manager which has heavy experience in construction progress, cost control, quality assurance.

6. Construction Team Capability and Responsibility:

a. Owen Transit Group, Inc. – Project Lead Contractor & Technology

William E. Owen, P. E. – President	c - 404-683-1331	billowen@otg-inc.com
David S. Owen – Exec. VP	c - 404-295-8277	davidowen@otg-inc.com
Mark S. Owen – VP	c – 678-641-3120	sonneteer3@hotmail.com

(1) William E. (Bill) Owen, P.E. is a Mechanical Engineering graduate of Auburn University in 1955 who began his professional work as a structural design engineer on the nacelles of the supersonic B-58 delta-wing bomber at General Dynamics' Fort Worth, TX office of Convair Aircraft Co., the builder of the B-36 bomber of the 1940's. His initial design work was on the engine pylon forgings and nacelle skins as well as engine-related oil cooler air ducts and engine shock wave inlet control supports. He left a later assignment on a nuclear-powered B-36 project to join the U.S. Coast Guard as an Engineering Officer (Ensign and later Lt.jg) at USCG Headquarters in Washington where he was the principal mechanical engineer for shore stations, special projects and lighthouses for three years while attending graduate school at George Washington University and writing his Master's thesis in

Engineering and Construction Management to determine USCG policy using Predictive Analytics. Following his active duty with the Coast Guard he was assigned to the Atlanta USCG Reserve Unit, as Training Officer as a full Lieutenant. Continuing valuable daily support has been provided through these later years by guidance from the Holy Spirit and the Bible.

(2) Lockheed Aircraft: After USCG active duty he joined Lockheed Aircraft Corp. as Assistant to the FAA Coordinator at Lockheed-Martin Aircraft in Marietta, Georgia, assisting with the FAA type certificate program for the Lockheed Jetstar. This was followed by Engineering Marketing support and project administrative cost control and schedule performance support to upper management on B-47, B-52 and C-5A aircraft modification projects. In 1968 Owen was assigned to sell L-500 freight aircraft (commercial version of the C-5A) in the international market, culminating in the sale of 10 L-500's to Nissan of Japan for automobile importing to the U.S.A.

(3) Other: In 1971 Bill Owen, left Lockheed and began private practice in mechanical systems design and construction, designing and building mechanical systems in large government, commercial and residential projects while supervising direct and indirect employees, marketing, technical support, financial planning and management of payrolls, taxes, and personnel services. Later, after passing national examinations, he became registered as a Professional Mechanical Engineer, consulting with builders and Architects by providing designs and specifications for many commercial buildings.

Owen's team designed and personally managed teams of construction teams in building large housing projects both in private as well as other public government projects throughout the Southeastern United States. He also provided systems (water, waste, site drainage, heating and air conditioning, site lighting, site electrical distribution, design for complete living unit electrical systems.) The team also designed major renovations for large historical buildings. Other experience was in systems' condition reviews of large buildings for insurers and major financing institutions. Owen provided regional buildings' systems standard design. Owen also provided design and construction management of regional government projects for the U.S. Post Office and the U.S. Housing and Urban Development, as well as U. S. Air Force training and communications facilities.

In the Atlanta region Owen designed public housing projects major renovations for construction dating from 1939 and later. The smallest project was in the Summerhill community (Atlanta), with a value of $600,000 , up to a $7.2 million cost for Herndon Homes, and with the largest being the Capitol Homes Project having a systems value of $45 million.

(4) David S. Owen, Exec. V.P., earned a degree in Business Management from Kennesaw State University, and then partnered as technical principal in creating an internet-based "Amazon-type" on-line internet-based furniture sales business with others, joining OTG, Inc in 1985. His duties at OTG, Inc. for 16 years were to support the technical and business operations of the company, principally the production and support of the design operations of the firm, while simultaneously creating an

Engineering Design Education video service. This service later developed into a separate multi-state production services firm after the business direction of OTG changed in 2001. This video services firm then was eventually absorbed into a large Atlanta-region Georgia school system of over 115,000 students and over 15,000 staff, one of the largest in the United States. His specialist experience includes top-level responsibility for creation of major public communications modes and content for the county school system's top officials. He represented OTG, Inc. in 2002 in Hanoi, Vietnam in technical discussions with the Vietnamese Minister of Transportation regarding HighRoad transit in Hanoi and Ho Chi Minh City (Saigon).

David's principal technical skills are as described above which expanded into high skills in managing Internet services such as those used in OTG's new application of safe automation of passenger vehicles and those used in automated ticketing and payments of transit fares avoiding large staffs of high-cost fares collectors. This application also involves automated payments to independent last-mile taxi vehicles when part-payments are made to vehicle operators.

(5) Mark S. Owen, V.P, earned a degree in Biology from Asbury College and became a key Heating and Air Conditioning Design Engineer in the contracting and design engineering operations of OTG. In 2001 after 18 years of practice with OTG while continuing studies in Environmental work at Georgia Tech he left OTG and became the international coordinator of Air Conditioning Design Standards and Publications and later Director of Publications for ASHRAE (American Society for Heating, Refrigeration and Air Conditioning Engineering). His work has taken him world-wide while coordinating the technical standards established by world leaders in the sciences that are used world-wide for the air conditioning and refrigeration industry.

(6) Team Duties: Technology, Government and Community Relations, Project Planning, Team Coordination & Project Financing. The project requires skills in planning, architecture and guideway and vehicle design, manufacturing, construction and managing all the elements to make a finished product ready for use by the public. Each one of the below-described team members is eminently qualified by education and experience. Their responsibilities as team members are described below.

b. C. W. Matthews Contracting Co., Inc. - Guideway Construction

Dan Garcia, President 770-422-7520 c-470-554-9490 dgarcia@cwmatthews.com
Roy (Buddy) Jump, VP 770-421-1279 c-770-377-7566 buddy@cwmatthews.com

(1) Dan Garcia, President, is the 4th president in the Company's 74-year history and leads all elements of the company. His leadership team is made up of Roy (Buddy) Jump, VP who supervises the projects, Michael D. Bell and two Matthews' family representatives, Charles E. Matthews and Matt D. Burton. The C. W. Matthews home office is located in Marietta near Kennesaw Mountain National Park, in Cobb County, a part of the Atlanta MPO region.

(2) Buddy Jump, VP, has a BSCE in civil engineering from Ga. Tech and is responsible for the progress of all company construction projects. His staff is qualified by the GA Department of Transportation and will construct the HighRoad project under those DOT standards to provide guideway construction and roadway Safety Management, while at the same time other projects continue, similar to those identified below. Atlantic Station remediation (Atlantic Steel site pollution) represents work done under management of the EPA. The company manages approximately 2,000 direct and subcontract employees for the present work.

(3) GA DOT Projects: Key recent roadway and bridge projects include the Atlanta 17th Street bridge, the I-85 bridge fire damage replacement, 14th Street Bridge, Panola Road, the I-75 South Managed Lane and are currently working on the I-85 Widening project, the last two under Federal Interstate Highway construction standards.

(4) Aviation: Aviation projects include the Atlanta Airport 5th Runway Embankment Project and the International Terminal at the Atlanta Airport. At this time the company is rapidly replacing the concrete that formed one of the Atlanta Airport's 1st runways, a rapid-construction program similar to that it provided with its earlier 5th runway original construction ($360,000,000) which it built over 18 months. The company also rapidly built the 4th runway ($900,000,000 over 12 months) under FAA design and operations rules while keeping the airport open.

(5) Transit: C. W. Matthews transit projects include the construction of the Atlanta Streetcar railway and rail lines and other track infrastructure to the MARTA Avondale Yard line from downtown Atlanta. For the HighRoad project the plan is to use guideway delivery of construction segments with a semi-automated process directly from the casting yard without using roadway delivery of heavy structure segments, and will use launching of innovative segments with non-hydraulic (to avoid spills) segment placement and new-technology post-tensioning allowing maximum spans at minimum cost and minimum environment disturbance.

(6) Duties: CWM will be responsible for right-of-way preparation for the guideway construction and assuring that all conservation, drainage, and EPA rules for construction are followed. They will build the columns for supporting the guideway, install all guideway segments, arrange for the installation of all electrical power wiring and utility connections, and assure that all post-tensioning is done in accordance with the guideway engineering plans and specifications. They will supervise others on the job site for safety and assure that the completed installation is commissioned as specified, and that the completed guideway project is ready for operation. They also will manage roadside safety and obtain roadway authority approvals for closures, openings and safety procedures for public traffic and project contractors.

c. Tindall Corporation - Guideway Segments:

Bryant Zavitz, P.E., VP, MASc Eng. 404-366-6270 , D-678-244-7900, c-404-313-0709 bryantzavitz@tindallcorp.com
Kevin Kirkley 678-244-7914 c-404-694-2177 kevinkirkley@tindallcorp.com

(1) Bryant Zavitz, V.P. of Product and Process Development, has over forty years' experience in the design and manufacturing of large precast structures, including multiple highway bridges for multiple states' Departments of Transportation as well as private railway bridges built to D.O.T. standards.

2) Kevin L. Kirkley, P.E, S.E., Director of Engineering, responsible for product and systems development, has 20 years' experience in the design and development of precast and prestressed structures, including many Heavy Industrial and specialty applications.

(3) Background: More than 87 years ago, in 1932 Tindall was begun and is now one of the largest, most experienced precast concrete fabrication companies in the industry. Tindall is now throughout the Southeastern USA, now having 5 PCI-Certified fabrication Plants in South Carolina, Virginia, Georgia, Mississippi, and Texas — and have tackled projects across the U.S., Canada, and even internationally. The HighRoad project is just the latest in projects' selecting Tindall as their pre-cast concrete manufacturer. To support this high-technology service with their over 1,500 employees they also employ more than 75 graduate Engineers and more than 30 Professional Engineers to assure compliance with safety and industry critical standards. The precast roadway sections for launching and standard AASHTO beams for more standard construction for state Departments of Transportation are their typical products. Their task with HighRoad will be to precast over 96,000 twenty-foot long by 7' x 7' complex cross-section guideway segments for launching while using the latest Keystone post-tensioning method for assuring guideway strength, longevity and a rigid rail track base. For this task new casting lots will be created near to guideway routes so that the segments can be delivered to job sites mainly by use of the guideways. Tindall is LEED Silver certified.

d. Top flight Top Flight Aerostructures, Inc. - Vehicle Design & Manufacturing:

Bill Visage 678-213-1370 c - 770-990-3200 bill.visage@TopflightAero.com
Greg Kress 678-213-1370 c – 678-378-7750 greg.kress@TopflightAero.com

(1) Bill Visage, President, is co-founder and has been serving as the company President since 2005. He is an aerospace engineer with over 25 years of engineering and aircraft structures experience, both commercial and military, and is responsible for business operations and business development. His technical expertise includes metal-bond and composite component overhaul, manufacture, and assembly. Prior to working with Top Flight Aerostructures, he worked for 10+ years at Delta Air Lines as an Engineering Supervisor for structural component repair. Visage holds a Bachelor of Science in Aerospace Engineering from the University of Virginia and is currently serves on the Advisory Boards for the Georgia Tech Manufacturing Extension Program and the Paulding College and Career Academy.

(2) Greg Kress, Vice President, is co-founder and has been serving in that role since 2005. Greg is an aeronautical engineer with over 30 years of engineering and aviation composites experience, and is a recognized industry Subject Matter Expert in Composites. He holds a Bachelor's Degree in Aviation Management from Southern

Illinois University and a Masters' Degree in Aeronautical Engineering from the US Naval Postgraduate School. Kress is a retired Commander with the US Navy, having served 14 years on active duty and 16 years in the reserves as an Aeronautical Engineering Duty officer. He has been a full and part-time contract instructor teaching industry short courses in composite repair, repair analysis, manufacturing, laminate design, structural analysis for Abaris Training out of Reno, Nevada. Greg worked for Delta Air Lines for 5 years as the Lead Composite Structures Engineer, and he currently serves on the Composite Materials Handbook committee (CMH-17).

(3) Top Flight Aerostructures, Inc. (TFA) was founded in 2005 and is a recognized industry leader as an aerospace composite and structures design and fabrication company for US military aircraft. TFA has internal capabilities and expertise for engineering design, tooling fabrication, large composite fabrication, complex assembly, and quality assurance testing. Their equipment includes all capability for producing aircraft-grade composite structures, including forming, molding and autoclaving components to meet Lockheed and U.S. Air Force standards. TFA maintains current AS9100 certification for aerospace quality management system.

(4) Location. TFA is located in Dallas, Georgia in a 50,000+ SF facility with ability for additional expansion of its shop floor space. TFA is a small business, currently maintaining an experienced and motived workforce of 35 professionals. TFA has completed reject projects for the US Air Force for the fabrication of large wing structures for the C-5 Galaxy and large doors for the B-2 Stealth Bomber. The company will be responsible for the Vehicle Cabin Design & Manufacturing using current composite body engineering. TFA has the experience and capabilities for development, design, and fabrication of the HighRoad project vehicle concept.

e. Cobb Industrial Fabricators – Drive Units and Components

David Wilkins, President 770-422-7054 x-242 dwilkins@cobbfab.com
Drew Jones, Sales 770-422-7054 x-228 c-678-977-7230 djones@cobbfab.com
Bill Wiseman, Shop Foreman 770-422-7054 bwiseman@cobbfab.com

(a) David Wilkins, President, has extensive experience in heavy steel products fabrication and has been President since 2003. He is responsible for managing the design and manufacturing services of the company, as well as assuring compliance with standards and production schedules.

(b) Drew Jones, Sales Manager, has been in the industry through family connections since he was 10 years old, and has been with Cobb Industrial Fabricators since 2009.

(c) Bill Wiseman, Shop Foreman, is also the Production Manager. He has been in manufacturing of heavy steel products for over 35 years, including production assignments with two Fortune 500 companies.

(d) Background: Established in 1972 in Acworth, Georgia, a suburb of Atlanta, the company has continued for almost 50 years. Their specialties include design and manufacturing of HighRoad vehicles' drive units with the combined 1,200 horsepower

of four VFD motors, and with pantographs, power brakes and the maintenance bay's steel platforms. As a major part of their participation, they will also design and build the traveling gantry used for rapid delivery and construction of the guideway. They will provide the guideway retraction and replacement assembles automated for the lowering and lifting of vehicles in the stations. The tasks also will include heavy steel welded segments and critical wheel alignment with the rails for the fast vehicles. They will work with all industrial materials needed for HighRoad including carbon steel, aluminum, stainless-steel and graphite. Their heavy machinery can make intricate and complex parts through certified welding and laser drilling of metals for precise assembly of components. Their large factory cranes can keep their high-capacity production lines moving.

f. B&D Industrial / ABB-Baldor Motors - Motors and Drives

Carl Tolbert	770-792-2922	678-282-4303	ctolbert@BDtechnologies.com
Jeff Sandrock	678-520-2206		jsandrock@BDtechnologies.com

(1) Carl Tolbert, VP Engineering, has his primary education in programs in engineering technology and economics, a PhD in Organizational Leadership from Columbia International University, a degree from Cornell University in Digital Marketing; and a MS in Stace Studies from American Military University, (with distinction), Tolbert is certified as a Specialist in Alternating Current Motor Drives. He is responsible for all engineering services provided by the company.

(2) Jeff Sandrock, Manager of Engineering, has an Associate Degree in Electrical Engineering from Southern Polytechnic Institute (Kennesaw State University, Marietta Campus), followed by consecutive positions in automation and electrical controls, and is now responsible for the engineering management of new automation system design and fabrication.

(3) Background: For 72 years, since 1949, B&D has provided and serviced many off-the-shelf and special components needed for the HighRoad. They have the experience with the equipment and the expert knowledge in-house to that end, including intensive detailed technical knowledge of constant torque variable speed drives, centralized in-region engineering support capability, and continuing expansion and sharpening of power, dynamics and force management skills. They maintain experimental / verification labs in Norcross, GA to assure hands-on quality control. B&D Industrial operates over 30 facilities in Georgia, Florida, North and South Carolina, Tennessee, Louisiana, and Washington and are proven to be a reliable supplier. Their highly experienced employees range from engineers, software developers, and certified service technicians to outside salespeople and customer service representatives. B&D represents many state-of-the-art automation brands in the world, including ABB, SEW, Banner, and Rollon, as well as Dodge and Timken bearings.

(4) Duties: Key items to be selected are standard ABB / Baldor VFD Motors (manufactured in Gainesville, GA), and their designed and manufactured matching VFD motor drive controls programmed for torque management and regenerative

braking. They assist in selecting bearings for the wheels and motor supports, and design, build and program the Programmable Logic Controllers used for vehicles' full automation and operating data collection and transmission. B&D also will provide training for operating personnel in preparation for manufacturing of vehicles followed with their operation, daily inspection and maintenance.

g. Newcomb & Boyd Engineers - Mechanical & Electrical Engineering

David Chandler, P.E. Sr. Partner-in-Charge (404) 730-8552
Dchandler@newcomb-boyd.com
Steve Bruning, P.E. Sr. Partner (Emeritus) (404) 730-8405
sbruning@newcomb-boyd.com
Courtney Costanzo, Marketing Group (404)730-8444
Ccostanzo@newcomb-boyd.com

(1) David Chandler, P.E. Partner-in-Charge, has 25 years of electrical engineering and project management experience, providing Electrical Engineering expertise over 460 projects, He has extensive experience in academic, government, transportation, and medical facilities. He holds a Bachelor of Electrical Engineering degree from Georgia Tech, a Bachelor of Science in Physics degree from the University of North Georgia and is a Georgia Registered Professional Engineer (PE). His certifications include as a LEED qualified Engineer and as a member of multiple professional societies.

(2) Background: Projects of the firm, beginning in 1904, include the original design of the Fox Theater ventilation system, and continuing with 87 years of more Atlanta large projects. They include the Hartsfield-Jackson Airport main electrical and underground duct bank, a new airport tunnel ventilation system, with new egress stairs, escalators and elevators to the terminal, a 72,000 square feet project with a $400,000,000 construction cost. They also provided the Communicable Disease Center (Atlanta) with engineering for an 1,800-car Parking Deck, as they did the Charleston International Airport Parking Deck for 1,260 vehicles, a 560,000 square feet expansion to both concourses at a $25,098,700 construction cost, and the Greenville-Spartanburg Airport 750 vehicles Parking Deck, Greer, SC, in a $37,000,000 project that also included a boiler plant. They did other design of an airport building automation system, and studies and equipment analyses totaling a $17,000,000 construction cost. Their present Engineering Services staff includes specialists in Mechanical 65, Electrical 43, Plumbing 16, Commissioning 9, Audio-Visual 8, Intelligent Buildings 7, Fire Protection 6, Sustainability 5, Security 5, Acoustics 4, Lighting 1, Technicians and Co-ops 13, and Administrative 22.

(3) Duties: The firm will provide Mechanical & Electrical Engineering Design Services employing many of their engineering and support staff of 223 registered engineers and supporting professionals with many engineering and scientific skills needed for the Atlanta HighRoad project. The principal services will be to design the

electrical systems for powering the transit vehicles and to establish control networks and calculate all final loads on the vehicles and guideway from the static and dynamic forces to be encountered. Additional services will be to verify that the system as built will serve the need of the people of the Atlanta region.

h. BRRAAI Architects, Inc. – Architects

Tom Rhodes, AIA – Principal 678-990-5656 c 404-625-6982
trhodes@BRR-Architects.com
Derik Rogers, Director Construction Administration 678-990-5656
drogers@BRR-Architects.com

(1) Tom Rhodes, AIA, the firm's Principal, an Architecture graduate of Georgia Tech, began in the mid- 1980's with the firm founded in 1973 under the direction of Richard Bradfield, AIA, assisting in creating award-winning designs of many public and private projects, including Federal Housing projects' original designs and extensive renovations which updated the projects by as much as 50 years. Rhodes later took over the firm when Mr. Bradfield and his lead architect Greg Richards retired from active work. He has been with the firm for over 35 years.

(2) Derek Rogers, Director of Construction Administration, has 34 years of experience with the firm in seeing that the projects are completed as designed and within budget. His participation assures the clients that the firm's designs meet the client's expectations and beyond, resulting from the firm's continuing field support to iron out any complications that may arise.

(3) Nathan Payne, RA, NCARB, LEED® AP has been with the firm for 8 years and is continuing the design quality and follow-through performance traditions of the firm.

(4) Duties: BRRAAI – Architects provides will provide station architectural design, construction management & land planning. BRRAAI – Architects is a full-service architectural firm devoted to quality design with an area of practice encompassing the entire Southeastern United States. Their offices are located in the heart of Sandy Springs, the core of Atlanta's rising growth.

i. Clayton Industries, Inc. – Rail fabrication and finishing for installation

Jim Clayton, President 1-205-715-2000 jclayton@claytonind.com
Steve Boner 1-205-980-2907 c 1-205-372.3-7564 sboner@bellsouth.net
John Clayton 1-205-715-2000 john@claytonind.com

(1) Background and Duties: Clayton is a large-capacity steel processing firm that specializes in difficult steel rolling, spiraling, bending, and forming of very large steel standard products of complex shapes, even including the miles of flat and straight

stainless-steel rails to be used for the HighRoad Guideways. They will provide the steel with smooth surfaces and sheared-to-match rail ends to provide no-gap smooth abutment for steel wheel transitions from rail-to-rail. Being located in Birmingham, AL, principal American steel-producing area, assures that the product will be of quality and that the shipping costs will be minimized, while rails will reliably be furnished for the entire time of construction from their optional multiple Alabama sources as needed. They have been in business for over 50 years, and will be a reliable part of the HighRoad team.

j. Synergy Group – Codes, protection of Riders, Workers, the Public & Fire Safety

Dwayne Garriss, Principal 404-783-7081 dwayne501@comcast.net

(1) Dwayne Garriss: Mechanical Engineering and Professional Architectural experience in building construction and building systems before moving to State Fire Marshal's Office in Atlanta. Served as primary Georgia State Codes Official and later as Georgia's State Fire Marshal, (highest rank) until retirement from government office.

(2) Duties: Provide consultant advice and implement regulations resulting from government codes & required compliance, including fire safety, architectural codes, assuring compliance with OSHA regulations and worker's and general liability insurance regulations and good practice, as well as methods of protecting workers, system riders, and the public from any hazardous involvement with the HighRoad system. Mr. Garriss has a degree in Architecture from the University of Georgia.

k. Station Construction Company to be named.

l. Guideway Mobility Group, Inc. – Operations Start-up and Management:

William E. Owen, P.E. - President c - 404-683-1331 billowen@otg-inc.com
David Owen – Exec. VP c - 404-295-8277 davidowen@otg-inc.com
Mark S. Owen – VP c – 678-641-3120 sonneteer3@hotmail.com

(1) Firm's Qualifications: Guideway Mobility Group, Inc. (GMG), has been designated as HighRoad Project Operations Manager since it the only approved operating management group organization familiar with the operations and its related cash flow during operations. It has a philosophy of limiting incurred costs associated only with providing transit and intercity rail service, and is not involved in other non-transit service / non-intercity rail service expense-creating activities. Brief resumes of managers in this firm are listed above in 6. a. above.

m. Operating Plan: Vehicles will provide service 24 hours a day every day using portions of each station for maintenance facilities. The stations also will be used for a smaller number of management and training facilities which will be based centrally to the operating system. Initial operation of any route will be for vehicles to arrive and depart at 4- to 5- minute intervals, and be capable of a greater number of arrivals and departures with as close as 1/2-minute separations as needed to support ridership

growth. Initial planning is based on 60% of the actual ridership experience of MARTA rail systems capacity (3,281 passengers per mile of route per day for HighRoad vs 5,468 passengers per mile of route per day for MARTA). This is a 40% margin of conservatism versus MARTA's 2019 actual experience.

n. Flexibility: By being flexible and considerate of the needs of riders the operations management will be open to modifying vehicles (at the risk of the operator) for higher speed commuter rail transit and high-speed rail service where it can be supplied with standard HighRoad transit vehicles operating at higher speeds (provided in standard HighRoad design) up to route-limited operational speed limits to be determined later and verified by experience tests of standing human passengers at the higher speeds. This hybrid operation is to be reviewed later as a part of improved service development activity. See **Specification O. Operations.**

o. Fares: Part of management is the need to please prospective customers sufficiently that their expectations are met and exceeded. To meet these needs a zone-fare will be charged based on the same 2021 fare rate of $2.50 used for MARTA rail trips averaging 6.87miles (averages $0.36 per mile for MARTA trips per FTA statistics) or a slightly lower $0.35 per mile planned for HighRoad. Fares (based on actual miles traveled) will be collected by use of credit and debit cards possessed and presented by the rider at times of entry to and exit from a vehicle platform. Charges will be calculated from distances traveled and billed to the cardholder's account with the card issuer. Transit agency cards will not be used. See **Specification F. Fares** for details of fare collection using automated and audited processes.

7. Schedule & Process:

a. Schedule: The design and construction of the project is estimated to take 16 years from an initial contracting date, considering that at present Atlanta regional heavy rail transit is sorely lacking and that this period will be required for financing and construction. Construction is to be completed at the approximate time that the region's population can financially support the partially– or fully- completed sections of the HighRoad system. Design and detailed planning of a sub-project is estimated to be completed primarily within the first two years, followed by construction of specific routes determined by each of the participating counties and coordinated by the ATL Authority as prescribed by Georgia Law, HB-930 (2018). The project schedules will be provided by each participating construction or operating team firm when project funding is available and a project plan is accepted.

b. Process: At the same time, the first project within the construction plan is expected to take about one year for final route planning during which time final designs will be completed for specific routes and State, local and Federal approval of right-of-way and acquisition of additional rights is begun. Two additional years will be required for the construction work of building and testing (commissioning) a revenue service line. After this two-year period, construction will be completed and commissioned and the line authorized for beginning beneficial operation. The first 15% of the construction is expected to be completed at that time, or be completed proportional to the financing plan for the project. The remaining portions of the line will be completed as funding

is arranged and the project design is approved by regional government authorities. See the cash flow and work phasing in **Excel Workbook P. Project** and Tables P1-P10**.**

Approval Process & Data Submitted

Supporting OTG's Proposed HighRoad FAST Project for *Atlanta Transit Link System* (ATL)

A. New Starts:

1. Name & Description: The ATL HighRoad project officially named the *Atlanta-Region Transit Link System* (ATL) and called HighRoad for the purpose of this submittal is a fixed guideway, elevated, heavy rail capacity transit system. It is proposed to serve the Atlanta region as defined by the Atlanta Regional Commission (ARC). A non-technical extended description of the HighRoad heavy rail capacity technology in PDF format is included at the end of this document on page 120 as PART J – DESCRIPTION: OTG Description Narrative**.** Abbreviated descriptions of stations and vehicles follow this paragraph.

a. Stations: Stations are planned to be built at an average spacing of 1.25 miles (equivalent to MARTA heavy rail station spacing) at locations convenient to the patrons to be served in the system route, and at greater distances where population density is less than the region average. Each station is designed to be able to handle an average of 4- times the initial station capacity, based on the goal of 2040 for complete system completion. This is to be done in order to provide the transit needed for the region as it grows in population and population density. Stations will be 12,600 square feet, provided on two floors, accessed by passenger elevators and escalators. The first floor also will have food services as well as systems management offices and provisions for maintenance of vehicles while providing 24- hour transit availability 372.3 days a year. Stations at route crossings and intersections will be three-levels and provide twice the service capacity as a standard station. All stations will have elevators, escalators, and food service vendors as arranged for rider comfort and convenience. Most stations will have maintenance facilities for vehicles and some stations will have administrative offices. See **Specification S. Stations** in PDF format.

b. Vehicles: Vehicles are 150-passenger elevated guideway cabins propelled by variable-speed electric VFD (Variable Frequency Drive) motors with steel-wheels controlled by Programmable Logic Controllers providing complete automated-but-supervised operation. The vehicles will enter the stations at opposite sides running in opposite directions and allow passenger entry and exit through multiple bi-parting automatic doors that provide full boarding platform safety for those waiting. Vehicles are designed for 85- mph service with 1200 horsepower of electric motors for each vehicle. Each vehicle will have self-securing means for 4 wheelchair-using patrons adjacent to the 4 wide doors. Seating will be for 37 passengers at 36- inch spacing of 20-inch-wide seats

primarily in a row along the vehicle side opposite its doors. Vehicles will operate at boarding floor levels a minimum of 26 feet above ground level, including within stations with gap-covering plates deployed automatically. See **Specification V. Vehicles** in PDF format**.**

2. Project Cost: The ATL HighRoad project cost complies with this minimum cost requirement. The ATL project *Atlanta Transit Link System* (ATL), also called HighRoad, when completed, is expected to cost approximately $20.0 billion in 2021 dollars. A copy of "ATLANTA REGION HIGHROAD 2021 372.3 MILE ATL ANALYSIS.pdf" of the HighRoad *Project Analysis for Atlanta* in Excel Workbook format covering engineering, performance and financial analysis of detailed information on each construction and operations cost element of the project is attached for a permanent, record of the analysis as **Excel Workbook P. Project** workbook and its Tables P1 – P11 presented below**.**

3. Minimum Cost Requirements Met: The Atlanta HighRoad (*Atlanta Transit Link System* (ATL)) Project (and each of its components) is hereby submitted as a combination of New Fixed Guideway system routes (with heavy rail capacity) and as an available addition to the capacity of existing regional heavy rail system routes (MARTA, but not a part of the MARTA system) within the region. Total project cost will be greater than $300 million and total New Starts funding sought exceeds $100 million, thereby meeting project cost criteria for FAST projects. See **Excel Workbook P. Project** workbook, and its Tables P1 – P11 cited above.

PART B
Heavy-Rail Ridership Region-Wide Forecasts based on Predictive Analytics

Note: Supporting Tables are presented below, beginning on page 68.

A. Timelines for Submittal of Travel Forecasting Information

1. Information for FTA Review — Region-wide Model — Incremental Model — STOPS

	(Months in advance of anticipated ratings request)		
a. Documentation of the model methodology *(Predictive Analytics)*	**4**	**3**	**n/a**
b. Documentation of model testing	**4**	**3**	**n/a**
c. Documentation of project-specific inputs	**4**	**3**	**n/a**
d. Draft-final forecasts for the project	**2**	**2**	**1**

(Last updated by FTA: Sunday, October 4, 2015)

B. FTA Ridership Forecast Models; (FTA documents are quoted with shaded background.)

1. Several FTA project-evaluation measures rely on travel forecasts prepared by sponsors of proposed New Starts and Small Starts projects. In its reviews to ensure their usefulness in project evaluation, FTA considers five aspects of the forecasts:

   a. The properties of the forecasting methods;

   b. The adequacy of current ridership data to support useful tests of the methods;

   c. The successful testing of the methods to demonstrate their grasp of current ridership;

   d. The reasonableness of inputs (demographics, service changes) used in the forecasts;

   e. The plausibility of the forecasts for the proposed project.

C. Project sponsors may choose among three different approaches to prepare ridership forecasts:

1. **Region-wide travel models**; This model has been chosen for the HighRoad system rider usage forecast. It is defined below in more detail, using Predictive Analytics based on modeling data provided by the FTA, MPO and Transit Agency records for the systems analyzed for travel

modeling, a deductive reasoning procedure, based on actual (true) transit conditions of system availability, actual usage and official population ridership shares in similar cities.

2. **Incremental data-driven methods**; This model was not chosen since it did not meet the OTG criteria of using only experience-proven ridership estimates that can be validated by examination of actual riders' patterns in similar large city environments similar to that of Atlanta and its surrounding counties within the MPO region of Atlanta.

3. **FTA's Simplified Trips-on-Project Software (STOPS).** This model was not chosen since it did not meet the OTG criteria of using only experience-proven ridership estimates that can be validated by examination of actual riders' patterns in similar large city environments similar to that of Atlanta and its surrounding counties within the MPO region of Atlanta.

D. The first two options depend entirely on local efforts both to develop the forecasting methods and to prepare the forecasts. Consequently, for these options, FTA's review will consider all five aspects of the forecasts. The third option relies on the product of FTA efforts to develop a forecasting method. Consequently, for this option, FTA's review needs to consider only the last two aspects of forecasts.

1. To provide sufficient time for these reviews and any follow-up with project sponsors, FTA has established timelines for submittal of travel forecasting information.

E. **The properties of the forecasting methods** (Using Predictive Analytics)

1. Ridership Calculations: Riders of a probable number in the base year and target years that will be served by the examined system. This is shown in **Excel Workbook R. Ridership** workbook and worksheets printed below as numbered Tables.

2. Basis: Riders for a sufficient distance and a sufficient fare to pay its share of project construction and operations costs are shown in **Excel Workbook P. Project** workbook, and its Tables P1 – P5 cited below, in worksheets "Sum", "Funds", "Opns-Cash", "Labor" & "Oper." in which ridership based on MARTA rail ridership is de-rated by 40% for a conservative approach and the resulting number is used as a baseline, while average distance traveled is increased from 6.7 miles to 10 miles (a 49% increase in average distance) with a system line length increase from 47.6 miles to 372.3 miles, an increase of 766% in the service area. The fare is planned to be held to a rate of $0.35 per mile compared to the $0.36 per mile as is now charged to users of the MARTA rail system.

3. Sufficient Riders: Riders of a sufficient number to pay HighRoad's share of operations costs. See **Excel Workbook R. Ridership** workbook, and its Tables R1 through R9 for the required information. Excel Workbooks P. and R. are open workbooks and can be used for calculation of "what-if" gaming, or gaming results can be provided by OTG. Cities with short rail lines will offer little access or service to the potential riders in the region. Cities with long rail lines will offer greater access or service to the potential riders in the region. Longer distance rail lines can carry more passengers a longer trip distance to more desirable destinations, increasing average trip lengths and average income per passenger while not increasing capital and other fixed costs per trip, resulting in financial stability in construction

and operation. High regional density increases the probability that a greater share of the population will participate in using the system, also improving financial stability.

4. Trip Length Reasonableness: Acceptability of Atlanta's spread-out region with its longer trips on transit that will be provided compared to the shorter trips of other major cities shown is likely to reinforce the ridership estimated for Atlanta. This also is shown in **Excel Workbook R. Ridership** "Table R7 – Modes" relating to comparable costs of regional travel, "Table R8 - Growth" relating to future usage of the system, "Table R9 - Density" relating to systems having high density but with relatively short system miles and "Table R10 – Stations" relating to proximity of stations to potential riders in a region.

F. The adequacy of current ridership data to support useful tests of the methods

1. Ridership Study Evidence of Accuracy: The study is to identify historical evidence that supports items 1. through 4. above through identification of successful comparable heavy rail capacity transit mode systems in the United States using a generally homogeneous regional population with similar customs and employment (industrial, retail, educational and other American commercial work patterns). Factors are also related to identifying routes, station locations with regard to handling the capacity of the line, station convenience to likely riders (station separation), and changes that may be needed in the study area to meet fairness standards for service availability and riders' affordability of transit. Data for each of the cities studied is similar in nature, useful in analyzing transit patterns, and comes from similar government or transit system sources.

2. Evidence of Method of Ridership Analysis: **Excel Workbook R. Ridership** worksheet "Table R1 - Atlanta" illustrates the analysis method. Initiation of the study was begun to determine the most effective alternative solution for use of transit to and from work (peak daily roadway usage) instead of with roads, meeting the growth of population requirements of the Atlanta MPO (Atlanta Regional Commission, the ARC) estimate of transportation needs for the region for years up to and including 2040 and 2050.

3. Application and Validation of Ridership Analysis Method: **Excel Workbook R. Ridership** worksheet "Table R8 - Growth" in year 2040 represents ARC's 40% estimated increase in roadway and transit service required for the public compared to the ARC's base year of 2015. The Atlanta rail transit system adequately serving only one county in the Atlanta region (referencing the non-Covid base year of 2019) had 19.838% of its daily ridership provided by the county (Fulton) population that has only 39.6 rail route miles available to them out of 47.6 miles in its system. The Atlanta rail transit system daily trips (in 2019) reached 4.92% of the 15-county region's total population whereas the calculated rail transit system daily trips for the completed 372.3-mile system by 2040 is expected to be 16.55% or more. This is due to the region gaining 372.3 more track miles serving the same region with more access to rail transit.

4. Evidence of Inadequate MARTA Funding: According to the ARC prediction of new construction required there is inadequate funding identified to expand the existing MARTA-supplied Atlanta rail transit services to meet present regional needs or the needs of 2040 and 2050. MARTA is viewed as the principal heavy-capacity option for increasing transit, although it is not affordable now and is not seen as affordable in the future. The data for these

calculations is supplied by the ARC and FTA's official reports for 2019, the last non-covid full operating year. MARTA's FTA operating and construction data supports this conclusion.

5. Evaluator's Studies: The calculations in **Excel Workbook R. Ridership** workbook is without locked cells so that the reviewing agencies can update the calculations beyond 2019 (base line performance comparison date for non-pandemic years) and verify both the method and results of the calculations. The tests for accuracy can be done by making "what-if" studies to evaluate the effects that changes to other city regions would also be more effective for serving those populations compared with "status-quo" management.

6. Examples of Ridership Analyses: Track mileage, station counts, regional density and ridership figures for studies of comparison cities' heavy rail systems **Excel Workbook R. Ridership** and its worksheets for the cities of Atlanta, New York City, Philadelphia, Washington DC and Chicago, shown as Tables R1 – R10, are all provided by the affected MPO, the FTA or by the heavy rail systems themselves. Supporting documents can be verified first-hand through system, county and MPO as well as FTA and transit industry web sites found on the internet. The tables listed above are examples of conditions of successful and unsuccessful large city rail transit cases.

G. Successful testing of methods to demonstrate their grasp of current ridership.

1. Evidence of the validity of ridership estimates: **Excel Workbook R. Ridership** - Tables R1 – R10. Because the recent Covid Pandemic of 2020 and 2021 greatly modified transit ridership patterns of the public, and a national heavy-rail ridership reduction of approximately 75% from 2019 (non-pandemic) was seen in the first quarter of 2021. This was in contrast to the year 2019 in which Atlanta's heavy-rail ridership was reported by APTA to be up 2% over 2018 while most other major cities were down approximately 3%, illustrating a present need for transit expansion. General ridership patterns established in Atlanta in the 2019 year are expected to be valid in late 2022 and beyond, and return when pandemic effects are ended. The 2019 patterns of ridership in all examined cities were used in this comparative analysis for future years. This is supported by the dilemma of commuters who also are seeing the population's (expanding) usage of already-congested Atlanta roadways, predicted by the ARC to continue in Atlanta through 2040 to 2050 and beyond. For that reason, a very conservative transit usage factor 40% less than actually existing with MARTA in 2019 was used for calculation of probability for successful operation of HighRoad in future years.

2. Ridership Evaluation by Mode: The above tables provide comparisons which illustrate HighRoad's superior relationship with other modes, particularly ridership capacity per mile of alternative modes, construction costs of alternative modes and of trips that result in increased taxes on all citizens including riders, and lower effective speed of trips of alternative modes.

3. Validity of Station Capacity: Evidence of the validity of HighRoad standard and enlarged (doubled or tripled) station expanded capacity estimates.

a. Station Capacity for Design Arrivals and Departures.

(1) Station and Turnstile Capacity. A HighRoad vehicle may have as many as 150 passengers. Arrivals of vehicles at 1-minute intervals (maximum design arrival rate

for two directions of a HighRoad system) would provide as many as 300 passengers per minute.

(2) Arriving Passengers Capacity. Capacity for arriving passengers immediately exiting a standard 12,800 square foot station are calculated by the distance walked from arrival platforms and down escalators (2 lanes per each of 2 stopped escalators totals 4 walking lanes to exiting doors on the floor below. (Additional passengers with special needs would have the two elevators operating to move 20 passengers per minute each to the ground floor.) Measured distance (longest path) from an arriving platform to an outside door is 80 feet, which can be covered at 2 feet per pace at 80 paces per minute totaling 320 passengers to exit per minute, exceeding a 1-minute passenger arrival rate at each of the two arrival platforms. Four bi-parting 4-feet wide door openings are provided at a distance no further than 57 feet from the exits from the escalators (or stairs if stopped) or elevators, allowing passage of 480 passengers per minute to exit through the doors at a rate of 2 persons per second.

(3) Boarding Times. Standard times for boarding and de-boarding using a Fast Turnstile Card method are 3 seconds per passenger. With over 6 boarding turnstiles and 6 arriving turnstiles provided for each boarding level side, with each platform's turnstiles handling as many as 120 passengers a minute and with arrivals over 4 minutes, normal capacity is approximately 4 x original capacity.

(4) Arrival Rates: If this rate of arrivals is exceeded in later years the designed station and turnstile capacity can be increased by adding additional egress turnstiles and exit escalators and elevators along with the building space if needed.

(5) Emergency Exiting: As many as 720 passengers in either direction under fire alarm emergency "open" management at an emergency pass-through of one second per person, a total of 1,440 passengers per minute can be processed in addition to ADA entry gates with 15 seconds allowed for each entry or departure. This exceeds the criteria of exiting within 2 minutes all passengers expected to arrive at a station.

(6) Station Usage: According to the "Subway and bus ridership for 2019" New York City MTA report on Manhattan station usage per day (arrivals) the maximum system usage in 2019 for transit rail was 205,159 per day at the Times Square rail station. Using a 12% peak flow ridership factor (Bechtel) that maximum would be 38,000 per peak hour. Consequently, a station of 2x the size of a standard HighRoad station (2 x 12,800 sq. ft.) would be needed, and its capacity would be as much as 54,000 per peak hour. This could be accomplished by lengthening the station, adding one additional boarding level with extended elevator columns and more escalators, with all costs borne during operations by the increased net fare amounts from above base-level utilization estimates. HighRoad calculations support an eventual 10x usage growth from the original beginning capacity, calculated as 10 x 1,197,492 beginning passengers per day, or 11,974,920 passengers per day, or approximately 2x the ridership shown in 2019 by the City of New York including all its boroughs. The conclusion is that the stations can meet present and future anticipated HighRoad passenger needs without any grants, using only internal income.

2. Future Growth Rates:

a. Evidence of Future Growth: This calculation is regarding the rate of vehicles capable of being handled in a station, based on a station's expected excessive passenger flow after 2040. Stations can handle growth by adding fare-collecting turnstiles in the station until a growth in excess of the stations' capacity is soon to be reached. In lieu of expanding existing stations which is a feasible plan, a policy of adding more stations on the line or constructing parallel HighRoad guideway lines would have the advantage of reducing station crowding while at the same time providing stations laterally closer to origins and destinations. This would be feasible since the cost of a HighRoad line is expected to be approximately one-fifth the cost of existing older-technology (trains) heavy rail transit and can be self-financed. See **Excel Workbook R. Ridership** Table R8 Growth.

b. Evidence of HighRoad Vehicle Sufficiency: The validity of HighRoad standard and enlarged (doubled, tripled, quadrupled or more) vehicle fleets and the ability of the system to handle this space growth needed for the services follows. The below paragraphs illustrate that the design and management of the Atlanta HighRoad system as planned will be capable of handling the service needs of its passenger rail vehicles. A chart illustrating this calculation is below. It is taken from **Excel Workbook P. Project** workbook, Table P6-Needed, shown below).

3. Stand-by Vehicles Readiness: By having stand-by excess vehicles in station maintenance bays equal to 2% of the calculated need of vehicles ready for one-minute deployment when rush-hour excesses require them can be met on a one-minute notice, and later rapidly removed from deployment when that service is not needed and stored in unused maintenance bays, below the moving vehicle guideway. This would assist in handling short-duration entertainment and sports-crowds late at night when transit usually is not available.

4. Maintenance Bays in Stations: By placing vehicle maintenance bays in stations there will be no need for maintenance buildings to be constructed and maintained or additional track to access the buildings or expenditure of time and energy in accessing them. Calculations support this statement as follow: For each station there will be 2 service bays, and a total of 16 bays out of 528 bays will be used for administrative purposes, providing 97% or 512 station bays available for service. Initial vehicles planned for the system number 257, allowing 200% of needed maintenance space for a beginning system.

5. Vehicle Servicing: Vehicle servicing capacity calculations assume that 1 service bay can handle only 1 vehicle per day for each of 2 shifts, providing service for 512 vehicles per day. Sharing bays during non-peak time for additional vehicle servicing is feasible for an added 512 vehicles per day, or service for 1024 vehicles per day, using two shifts. A third shift allowing 1,536 vehicles per day in the original station design assures growth of servicing in stations of 6 x the original servicing capacity. Initial design is for 220 vehicles to be serviced per day but capacity is for 1024 vehicles at beginning full service in 3 shifts without added unbudgeted cost or manpower. This would support system capacity throughput growth by 6 times up to a daily capacity of 6 x HighRoad's beginning capacity of 1,197,492 passengers can grow to 7,184,952 passengers per day, comparable to the entire actual weekday average rail passengers carried in all the rail-served boroughs of New York City in 2019. Vehicle servicing will consist of daily scheduled preventive-maintenance procedures in addition to unscheduled repairs and

replacements, providing longer MTBF (Mean Time Between Failure) numbers for critical parts.

6. Administrative Service Facilities: By placing administrative offices in stations there will be no need for administration buildings or additional parking needed to access the buildings. All administration offices will be readily accessible to employees relying for on-site presence at locations on the transit system within minutes of each other by using HighRoad, taking less time, expense or capital than would the use of individual automobiles and their needed parking in accessing them. Calculations support this statement as follow: For the system there will be a number of spaces (instead of vehicle service bays) used for administration as needed, such as general management, Central Supervising Support, training, ticketing and finance management, insurance, personnel, security, maintenance planning and management, construction management and administration, and public information. No services not required for operation, repair and expansion will be housed in the stations.

7. Twenty-four- Hour Passenger Service Availability: Present rail transit to the Atlanta Airport is limited to its vehicle availability schedule. That system operates only approximately 20 hours a day, and passengers arriving from distant places at the Airport must seek other means to access their final destinations at locations throughout the region. This is known by travelers, and is a consideration in using Atlanta as a destination, or in considering one's travel schedule, a possible restraint on business or on personal matters. Highroad, in contrast, by operating 24 hours a day can provide this regional service, enhancing Atlanta's attractiveness as a place to live, work, or provide large meetings and conventions.

8. Operations Plan: An Operations Plan is provided in **Specification O. Operations** to further explain how the system's operation would be handled by Management.

H. The reasonableness of inputs (demographics, service changes) in the forecasts

1. Basis: All calculations for the analyses are based on actual official data published by the regional MPO, the FTA, the region's transit agencies or the governments of the regions.

2. Similarity of Miles: Daily ridership per two-direction service track-mile with similarity of city workers, non-farming. See **Excel Workbook R. Ridership** Tables R1 – R11. All data comes from government sources.

3. Similarity of Density: Similarity of increasing population density (density relationship to % of population as riders). More density yields more riders per mile, but more track mileage yields more service to the community. See **Excel Workbook R. Ridership** Tables R1 – R11. All data comes from government sources.

4. Similarity of Share of Using Population: Daily ridership as a percentage of total population. See **Excel Workbook R. Ridership** Tables R1 – R11. All data comes from government sources.

5. Similarity of Population Groups: Older drivers may drive more slowly due to reduced physical and perception skills. Skills of older drivers may prevent their comfortable use of Interstate roadways and support their more comfortable choices of local arterials. Younger drivers may drive more aggressively, creating other drivers' sense of risk. This becomes an

inducement in communities with larger older populations for preferring to use public transportation, supported by their receiving higher transit speeds at lower costs, and by providing Uber / Lyft / public bus service for first-mile / last-mile trips, all provided by HighRoad.

6. Similarity of Congestion of Existing Roadways: AASHTO standards are used in creating **Excel Workbook P. Congestion Table** – P7- Congestion. It uses variable speeds in the multi-lane roadway type, based on AASHTO lane design standards, and is open to gaming by varying the speeds, traffic light intervals, traffic light scheduling, and acceleration and deceleration times. Local roads, arterials and Interstates can be modified in the gaming to help the reviewer to understand the roadway design conditions creating congestion, forcing some drivers to move to alternate roadways and other modes, or possibly to select HighRoad rail as the preferred travel mode.

I. The plausibility of the forecasts for the proposed project.

1. Ridership Analysis: A Ridership Analysis of HighRoad technology proposed for use in the Atlanta region is attached as The HighRoad project is proposed in response to a stated need by the Atlanta Regional Commission (ARC) to provide infrastructure in the Atlanta region for anticipated 40% population growth in the region in selected counties by the year 2040, and proportionally more by the year 2050. A detailed Ridership Analysis was prepared by OTG for those same regional counties (and two additional counties also qualifying for inclusion by their present populations) showing expected growth during the 21 years between 2019 and 2040. The Ridership Analysis also shows the miles of rail transit to be supplied in each county by OTG and their current expected costs. The Analysis takes into account the existing service provided (before the Covid Pandemic) in 2019 by the Metro Atlanta Rapid Transit Authority (MARTA).

a. Rider Employment Similarities: Daily ridership per two-direction service track-mile with similarity of large city workers, with non-farming, families with common American-type ages and social characteristics. **Excel Workbook R. Ridership** Tables R1 – R11. All data comes from government sources.

b. City Density and Track Miles: Similarity of increasing population density (density relationship to % of population as riders). More density provides more riders having access per mile, and more miles of track provides more service to the region. **Excel Workbook R. Ridership** Tables R1–R11. All data comes from government sources.

c. Similarity of Congestion: Uses AASHTO standards (speed per roadway type, Arterials compared to Interstates and typical American driver usage that can move frustrated and delayed drivers to alternate roadways and modes based on money and time that would be saved by using HighRoad. See **Excel Workbook P. Project,** Table P7-Congestion.

d. Growth: An analysis of population increases of the counties of the Atlanta region is provided as in **Excel Workbook R. Ridership**, Table R8-Growth. It shows 20-year and 30-year predictions of population of the Atlanta region and by listed county. Expected growth of the Atlanta region is expected to continue because of its lack of geographic

limitations of water or mountain boundaries or water supplies, with lower taxes, lower costs of living and lower housing costs. This analysis supports planning by extending the results of this ridership study into the future, allowing leadership to predict with some certainty the need for increasing transportation infrastructure. Affordable fares as compared to other cities' higher costs of living and automobile transportation funds limited and public transportation funded by taxes in larger cities set Atlanta apart as a region in which goals can be accomplished, and not merely set as targets and then forgotten since the leaders did not accept an affordable, effective and sustainable proposal when it was offered to them.

e. Plausible Basis: The Ridership Analysis above uses Fulton County in the Atlanta Georgia MPO as the basis for ridership forecasts based on population density since Fulton County has a population density less than that of Gwinnett, DeKalb and Cobb Counties, making the process more conservative and accurate. Fulton County at present has heavy rail transit, while DeKalb County has little service and Gwinnett and Cobb counties have none. Therefore, DeKalb, Gwinnett and Cobb counties are likely to be even more capable of supporting rail transit at the same or greater level as Fulton County based on comparative Predictive Analytics.

f. Standard of Usage: MARTA rail (in 2019) served about 5,468 rail passengers per mile per day (a standard validating a regional user's likely acceptance of rail transit) proving that such ridership is feasible. Because HighRoad can be self-sustaining at only 3,281 passengers per mile per day, average throughout the region, it is reasonable to offer service on that basis. That service level required for financial sustainability is only 60% that of MARTA heavy rail, a conservative and riskless conclusion of a minimum ridership forecast using the same fare per mile for both systems experienced daily in 2019 (pre-pandemic operations). **Excel Workbook R. Ridership,** Tables R1 through R11.

g. Large City Comparisons: Comparisons with ridership in other large American metropolitan cities were prepared using MPO, FTA, and Transit Agency reports. Additional Ridership Studies of HighRoad technology proposed for use in the Atlanta region relate the actual conditions of population, density, similarity of population characteristics population income, existing track mileage, comparing present and future HighRoad heavy rail transit in Atlanta to comparable characteristics of the regions of similarly-sized systems in the United States. **Excel Workbook R. Ridership,** Tables R1 through R11.

h. Support for Results: These comparisons reasonably support the Atlanta region's need for transit from a fairness point of view, its ability in 2019 to support the cash flow needed for transit sustainability, and the affordable 2021 to 2040 expansion ability of a HighRoad system to reach more sections of the region that have suffered from inadequate connection to regional transit. Since the purpose of transit is to meet the transportation needs of all citizens, the study supports and justifies the acceptance of HighRoad for the region. All ridership studies are combined and attached in PDF format as **Excel Workbook R. Ridership**, Tables R1 through R11.

i. Ridership Financial Sufficiency: HighRoad has initial heavy rail capacity with a capacity increase growth factor of up to 10 or more based on the when-needed addition of

HighRoad vehicles on a beginning 372.3-mile line by shortening headways while at the same time increasing availability of transit. Its worksheets regarding an initial ridership level needed to meet its initial transportation service needs, relate the various sources of funding for that service. The funding analysis, beginning with recycling of contingent State and Federal taxes from construction, adding funds from issuance of bonds by Federal Government agencies that are repaid from operations earnings and adding Public-Private-Partnership (PPP or P3) funds provided by the project's construction and operations management company. See **Excel Workbook R. Project,** Tables P1 – P5.

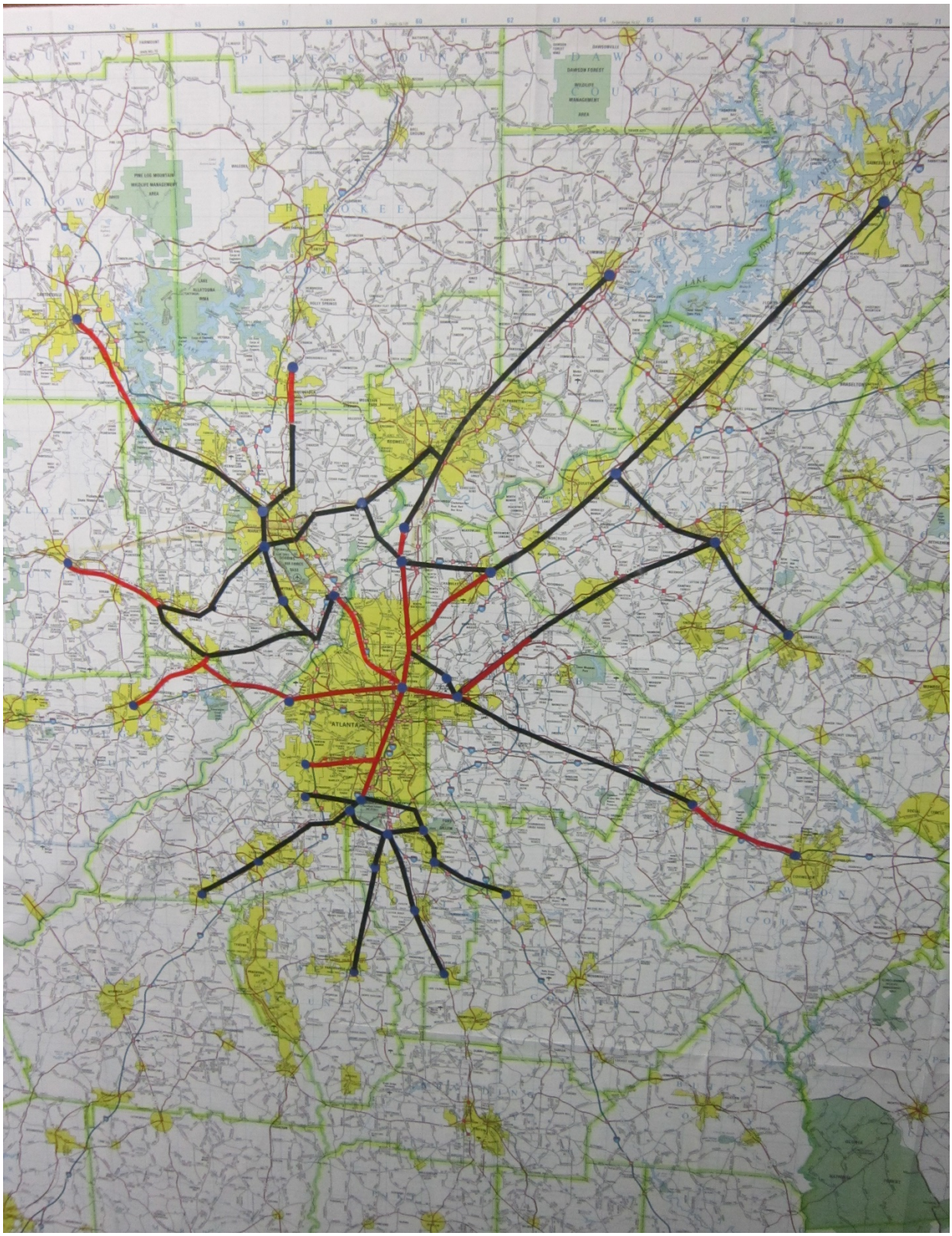
j. Ridership Based Cash Flow: The Study illustrates how the funds can be provided (with no-cost recycling of tax collection from the project employment, with rational cooperation from the governments) and how the P3 participant can bridge the gap between available funds and funds needed, and how the P3 participant can be the principal participant-at-risk to assure project completion and sustainable operation. A Cash-Flow Study of construction and operations funding and subsequent operations for a 39-year period is shown in **Excel Workbook P. Project,** Tables P1 – P5.

k. Performance: HighRoad's vehicle performance with higher speeds and vehicle capacity is shown in the Excel workbooks attached as **Excel Workbook Calculations 1.** for Dynamics and Statics and **Excel Workbook Calculations 2.** for Guideway and Launching. They analyze the performance of a HighRoad system from an engineering review of all its static and centrifugal forces and related linear dynamic performance and effects on passengers on curves at variable speeds, as well as the degrees of tilting needed to keep passengers comfortable without track lateral angle superelevation and at all probable speeds. Its worksheet "TILT" illustrates HighRoad vehicles' capability to meet the speed and comfort standards presented above. Its worksheet "CAPACITY" illustrates HighRoad vehicles' capability to meet the Ridership Passenger estimates presented above.

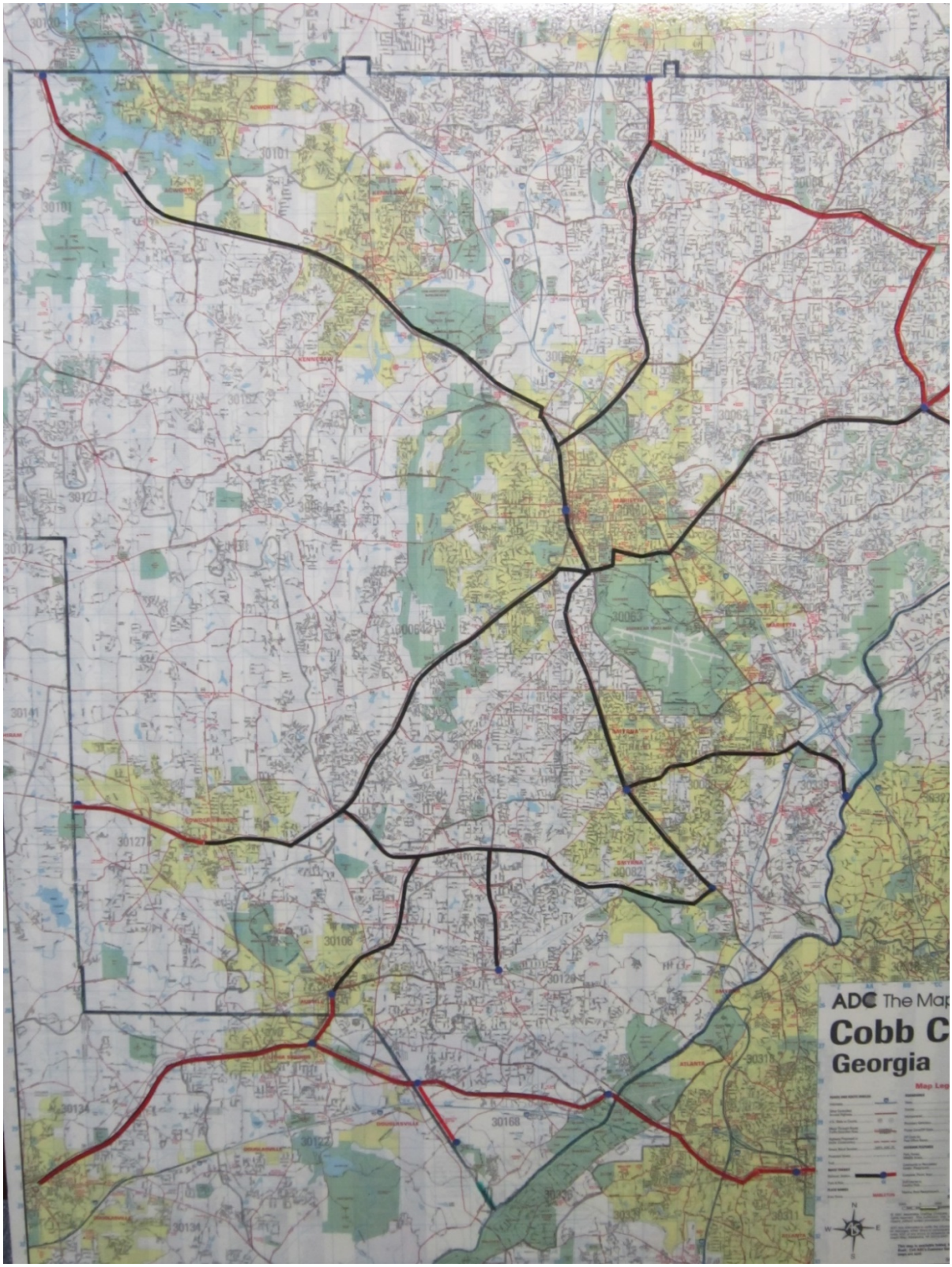
l. Availability of Service: Success of a heavy rail transit system is dependent on its convenient availability to the public who need the service and who find that it is to their advantage to take transit rather that any of the alternatives. In planning a system this need is met by judicious selection of routes that are close to homes and destinations and are relatively easy to access. With a HighRoad system viewed as a radial plan from city centers in the region extending to all reasonable destinations, homes and work places, lines are closer to origins and destinations near high density locations, and further away from them in low density locations, remediated by use of first-mile / last-mile services.

m. First Mile / Last Mile: In addition, the access can be supplemented by assisting in shared vehicles such as provided by Uber and Lyft. It is expected that transit riders will walk up to 10 minutes to a station, weather permitting, indicating an average distance of one-half mile, or drive that distance to a station if the ultimate time and cost savings support it. Use of these services also is dependent on costs affected by closeness of origins and destinations to transit stations. The HighRoad plan includes a share of its income dedicated to supplementing Uber and Lyft or local buses fares to allow a low passenger-paid fare, inviting more marginal HighRoad transit system usage, lowering marginal HighRoad costs, and improving HighRoad service to the public. A financial analysis of this procedure and its profitability to the Uber or Lyft or local bus transit systems is provided in **Excel Workbook P. Project,** Table P8-Uber.

n. Routes: A main reason for choosing specific new rail transit routes in a greater planning activity is to assure that the limited resources for building a line are used for the greatest benefit to the public while at the same time minimizing automobile use of roadway construction resources that provide rapidly-congested lanes, while providing greater opportunities for the people, thereby increasing HighRoad ridership. These route choices are primarily those chosen as closest to the dense centers of populations while at the same time positioned to intercept roadway traffic originating in the jurisdiction (or more distant sections of the jurisdiction) and originating outside the jurisdiction. Draft transit route maps of the region are provided in the 2 pages below, first at the total region, second as Cobb County, a fair example of the routes a county is likely to choose based on the route selection criteria that is proposed for operating financial stability and fairness.



M-1: Atlanta Region Draft HighRoad Routes
Black routes are HighRoad-proposed, red routes are MARTA and proposed as needed.



M-2: Cobb County Draft HighRoad Routes (Typical)
Black and red routes are HighRoad-proposed and proposed as needed. (County example)

o. Intercepting Traffic: Intercepting outside traffic can assist in building a HighRoad transit line since each added rider adds net income to the system, and can help pay off bonds and generally support the line. While an existing property may have its value significantly increased by its being on a HighRoad route, this will not be a reason for selecting a route, since ultimate service to the public is the purpose of the system routes. The regional and Cobb County maps show existing potential HighRoad routes in counties identified as sufficiently-wide for installation of a guideway and are also suggested as through-traffic and riders' interceptor lines if that is an attribute for the routes suggested in **Excel Workbook P. Project**, Table P-10**.**

p. Riders' Income Sufficiency: All calculations for the analyses are based on actual official data published by the regional MPO, the FTA, the region's transit agencies or the governments of the regions. American cities of similar sizes are also comparable with wages since an area's wages reflect the area's comparative costs of living, rendering all wages adjustable to a common value of a unit of pay, a dollar**.** A great discrepancy exists between present American rail transit systems' affordability and HighRoad. The present systems are so expensive to operate that they require huge subsidies taken from the taxes of the people of the systems' regions and the Federal treasury. These annually-recurring expenses are not needed for construction or operations for any city or region that adopts HighRoad transit. As a result, adoption of HighRoad is likely to improve a $50,000-a-year workers' gross income by $1,180 a year from reduction of taxes and the costs of operating an automobile, increasing the worker's disposable income. With disposable income of about 65% of gross income, and HighRoad cost of $1,820 a year compared to about $3,000 a year for insurance, taxes, fuel and maintenance and a small monthly payment for one older automobile the worker would add about 3.6 % a year to a rider's net spendable earnings. This is a very significant cash income increase to the workers, in addition to the time needed for driving and maintenance of an automobile.

q. Riders' Mode Choice: By choosing HighRoad over a first or second automobile in a household the rider's family income can be substantially increased by the additional difference of the annual cost of maintaining and operating a car, estimated as about twice the savings shown in the above paragraph (7.2% approximately for all replaced automobile usage), based on increased car usage, particularly in TOD-type close-to-transit communities. That $300 a month (after taxes) can make a large improvement in accessibility of affordable housing and a higher standard of living. In Fulton County, Georgia, over 19% of the population prefers rail transit according to FTA records.

A. Method of Ridership Forecasting

1. Method: The FTA's option 1. Region-wide travel model is one of three options offered by the FTA and the Predictive Analytics analysis follows, presented in Section III, below. Predictive Analytics was used by Lockheed Aircraft in preparing accurate validation cost estimates for the C-5A aircraft for the U. S. Air Force, with the author of this document participating as a member of that team for seven years. The ridership calculations for HighRoad in the Atlanta region are presented in printed form below and in **Excel Workbook R. Ridership,** Tables R1-R11 (including Logic: Study Method for Forecasting) also presented in the pages below.

2. Justification: HighRoad is proposed to satisfy the need for and support of an extended high-capacity Heavy Rail Atlanta fixed elevated guideway system with consideration of the need, the affordability, and the fairness to all citizens in the region, while reducing the governments' costs of building additional roads and bridges in the region.

3. Predictive Analytics: The first purpose of this Ridership Study is (a) to study the probability of a system having sufficient ridership in a population area to financially support (depending on ridership volume and an acceptable fare) with the type of transit being proposed and (b) to study the probability of a system meeting the mobility and economic advancement needs of the service area. This product is a deductive reasoning process based on the included "Logic of the Study Method of Forecasting Estimates of HighRoad Heavy Rail Ridership for Atlanta", found as a worksheet Table 11 in **Excel Workbook R.** The workbook's Worksheet Tables 1 through 11 keyed on the study results including Atlanta, GA, New York City, NY, Washington, DC, Philadelphia, PA, and Chicago, IL, each consisting of a regional study of facilities (miles of double-track rail and number of stations) that include counties served or to be served by heavy rail transit in the Atlanta, Georgia region.

4. Predictive Characteristics / Data: The second purpose of a Ridership Study is (a) to study the physical characteristics and official data of existing transit systems of comparable population areas and of the Atlanta region with a HighRoad transit system that is proposed to provide the transportation services needed to satisfy the expectations of the first purpose and (b) to study the financing and operating characteristics of the system to verify its soundness and likely ability for the system to be successful in service and in affordability. In short, the past systems operations in other cities and in Atlanta provide a clear window into the future operation of a similar transit service by using improved technology and innovative management.

TABLE R1 - ATLANTA 13 COUNTY (15 COUNTY) REGION TRANSIT RIDERSHIP ANALYTICS 2019

STATISTICAL ANALYSIS BASED ON PROPORTIONAL ARC POPULATION RECORDS UPDATED FROM APTA

	3,218	HIGHROAD PASSENGERS PER 2-WAY MILE / DAY INITIALLY, WITH CAPACITY TO GROW X 10 TIMES					AVG. HIGHROAD RIDERS 365 DAYS				2021	$ 54.795 MILLION PER MILE FOR HIGHROAD				
DATA ANALYZED	5,468	ACTUAL OFFICIAL 2019 FTA MARTA RAIL PASSENGERS PER 2-WAY TRACK- MILE / WEEKDAY (FTA) UNLINKED					MARTA UNLINKED DAILY PAX 365 (FTA)		260,273		2020	$ 250 MILLION PER MILE FOR MARTA				
1. ARC BASIC DATA:	**FULTON**	**DEKALB**	**CLAYTON**	**COBB**	**GWINNETT**	**CHEROKEE**	**HENRY**	**FORSYTH**	**HALL**	**PAULDING**	**COWETA**	**DOUGLAS**	**FAYETTE**	**BARTOW**	**ROCKDALE**	**TOTALS**
AREA, SQUARE MILES	534	271	144	345	433	434	633	436	458	312	202	201	463	470	536	5,872
POPULATION (2019)	1,063,937	722,161	267,542	741,000	877,922	230,985	230,220	221,019	202,148	148,987	140,526	138,776	112,300	101,736	90,900	5,290,159
POPULATION DENSITY / SQ. MI.	1,992	2,665	1,858	2,148	2,028	532	364	507	441	478	696	690	243	216	170	901
2. MARTA RAIL CURRENT SERVICE	**FULTON**	**DEKALB**	**CLAYTON**	**UNLINKED TRIPS**		**SELECT 1 OR 0:**		**1**	**202,148**			**SELECT 1 OR 0:**	**1**	**101,736**		**POP. %**
% OF POPULATION USE RAIL 2/DAY	19.838%	3.407%	0.00%	X2 = % OF RAIL RIDERS		PRESENT USAGE BASED ON SHARE OF FULTON CO. 2019 POPULATION & USAGE.									2,019	4.920%
FTA OFFICIAL RIDERS / WKDAY 2019	211,062	49,211	0	260,273		2040 USAGE BASED ON SHARE OF FULTON CO. 2040 POPULATION ESTIMATE & USAGE %.									2,040	14.907%
2019 MILES OF MARTA RAIL (FTA)	38.60	9.0	0	47.6		MILES NEEDED BASED ON TRACK MILES PROPORTIONED TO MARTA PAX PER TRACK MILE.										
3. PRESENT RAIL SERVICE NEEDS:	**FULTON**	**DEKALB**	**CLAYTON**	**COBB**	**GWINNETT**	**CHEROKEE**	**HENRY**	**FORSYTH**	**HALL**	**PAULDING**	**COWETA**	**DOUGLAS**	**FAYETTE**	**BARTOW**	**ROCKDALE**	
HR TRIPS % SAME AS FULTON	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	19.838%	
ADD 2019 NEW HR RIDERS	0.0	94,050	53,074	146,998	174,160	45,822	45,671	43,845	40,102	29,556	27,877	27,530	22,278	20,182	18,033	789,178
NEW MILES OF HIGHROAD	0.0	29.2	16.5	45.7	54.1	14.2	14.2	13.6	12.5	9.2	8.7	8.6	6.9	6.3	5.6	245.2
HIGHROAD COST (MILLIONS)	$ -	$ 1,601.4	$ 903.7	$ 2,503.0	$ 2,965.5	$ 780.2	$ 777.7	$ 746.6	$ 682.8	$ 503.3	$ 474.7	$ 468.8	$ 379.3	$ 343.7	$ 307.1	$ 13,438
4. FUTURE RAIL SERVICE NEEDS:	**FULTON**	**DEKALB**	**CLAYTON**	**COBB**	**GWINNETT**	**CHEROKEE**	**HENRY**	**FORSYTH**	**HALL**	**PAULDING**	**COWETA**	**DOUGLAS**	**FAYETTE**	**BARTOW**	**ROCKDALE**	
ADD 30% ARC GROWTH 2020 - 2040	63,319	42,978	15,922	44,099	52,248	13,747	13,701	13,154	12,031	8,867	8,363	8,259	6,683	6,055	5,410	314,835
TOTAL NEW RIDERS (2020-2040)	63,319	137,028	68,997	191,098	226,409	59,569	59,372	56,999	52,132	38,422	36,240	35,789	28,961	26,237	23,442	1,104,014
ADD NEW RIDER HIGHROAD MILES	19.7	42.6	4.9	13.7	16.2	4.3	4.3	4.1	3.7	2.8	2.6	2.6	2.1	1.9	1.7	127.1
ADD 2040 BASIC COST (MILLIONS)	$ 1,078.2	$ 2,333.3	$ 271.1	$ 750.9	$ 889.7	$ 234.1	$ 233.3	$ 224.0	$ 204.9	$ 151.0	$ 142.4	$ 140.6	$ 113.8	$ 103.1	$ 92.1	$ 6,962
5. ADD FUTURE SYNERGY:	**FULTON**	**DEKALB**	**CLAYTON**	**COBB**	**GWINNETT**	**CHEROKEE**	**HENRY**	**FORSYTH**	**HALL**	**PAULDING**	**COWETA**	**DOUGLAS**	**FAYETTE**	**BARTOW**	**ROCKDALE**	
ADD CONNECTION SYNERGY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6% CONNECTION SYNERGY	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
6. RESULTS FROM HIGHROAD:	**FULTON**	**DEKALB**	**CLAYTON**	**COBB**	**GWINNETT**	**CHEROKEE**	**HENRY**	**FORSYTH**	**HALL**	**PAULDING**	**COWETA**	**DOUGLAS**	**FAYETTE**	**BARTOW**	**ROCKDALE**	
HIGHROAD RIDERSHIP BY 2040	63,319	137,028	68,997	191,098	226,409	59,569	59,372	56,999	52,132	38,422	36,240	35,789	28,961	26,237	23,442	1,104,014
HIGHROAD MILES BY 2040	19.7	71.8	21.4	59.4	70.4	18.5	18.4	17.7	16.2	11.9	11.3	11.1	9.0	8.2	7.3	372.3
TOTAL HIGHROAD COST (MILLIONS)	$ 1,078	$ 3,935	$ 1,175	$ 3,254	$ 3,855	$ 1,014	$ 1,011	$ 971	$ 888	$ 654	$ 617	$ 609	$ 493	$ 447	$ 399	$ 20,400

1. THIS SPREADSHEET IS TO ESTIMATE THE NUMBER OF PERSONS PER DAY THAT CAN BE EXPECTED TO BE PASSENGERS ON A REGIONAL HIGHROAD RAPID TRANSIT RAIL SYSTEM.
2. IT IS AN ESTIMATE FORMED BY USING THE MARTA HEAVY RAIL ACTUAL RIDERSHIP IN FULTON COUNTY FOR PROPORTIONAL RIDERSHIP, WITH THE EXPECTATION THAT OTHER COUNTIES WITH SIMILAR POPULATIONS IN SIMILAR COMMUNITIES IN THE ATLANTA TRANSIT LINK (ATL) JURISDICTION. THE ESTIMATE IS FORMULATED FROM SIMILAR MARTA RAIL VEHICLE SPEEDS, USING THE SAME FARE EFFECTIVE RATE OF $0.35 PER MILE, THE SAME OR LONGER OPERATING HOURS, AND IMPROVED FREQUENCY OF SERVICE.
3. HIGHROAD SYSTEMS CAN BE BUILT FOR APPROXIMATELY 1/5 THE COST OF A NEW ATLANTA HEAVY RAIL SYSTEM.
4. ANALYSES SHOW THAT THE HIGHROAD OPERATING COST FOR EACH PASSENGER IS LESS THAN OPERATING COST OF CONVENTIONAL HEAVY RAIL.
5. THIS ANALYSIS IS FOR SERVICE AND CONSTRUCTION REQUIREMENTS COMPARISON ONLY.
6. POPULATIONS OF ALL STUDIED AREAS ARE NON-FARMING AND REPRESENT A GENERALLY HOMOGENOUS NATIONAL POPULATION.

MILES	372.3	$ 20,400
WITH HALL & BARTOW		

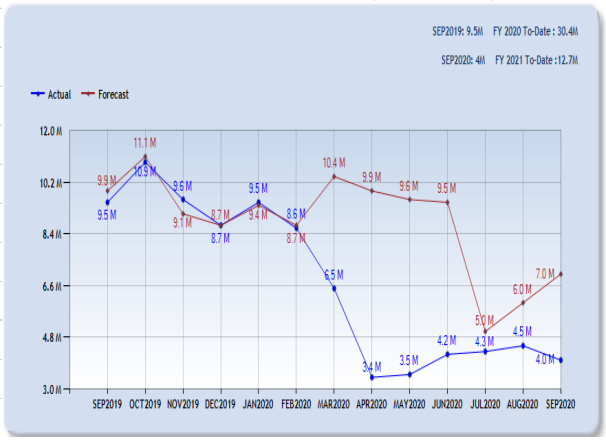
MILES	348.8	$ 19,115
W/O HALL & BARTOW		

NOTE (a): COBB, DEKALB AND GWINNETT POPULATION DENSITIES ARE GREATER THAN THAT OF FULTON COUNTY.
NOTE (b): COBB, DEKALB AND GWINNETT COUNTIES HAVE LITTLE OR NO RAIL TRANSIT SYSTEMS.
NOTE (c): FULTON, DEKALB AND CLAYTON COUNTY CITIZENS PAY FULL MARTA TAX.

This ridership analysis is updated from earlier analyses. It is based on the ARC 25-year 2015 growth estimate, recently verified by ARC, extending proportionally another ten years to 2050.
Calculations were simplified, and verified using Statistical Sampling of Large Homogeneous Populations. Population basics and ridership criteria did not change from the original data.
Estimates and calculations prepared from FTA data and ARC data by William E. Owen & Associates, Consulting Engineers & Planners June 10, 2021.
Contact: 404-683-1331

TABLE R1-A: OFFICIAL MARTA RIDERSHIP STATISTICS

OFFICIAL MARTA RAIL UNLINKED RIDERSHIP STATISTICS FROM GRAPH BELOW- 7-DAY WEEKS	
9,640,000	AVERAGE PASSENGERS FALL -WINTER 2019 PEAK BEFORE PANDEMIC
321,333	PASSENGERS PER DAY 1/30 UNLINKED
47.6	MILES OF ROUTE
6,751	PASSENGERS PER MILE / DAY UNLINKED
OFFICIAL MARTA RAIL UNLINKED RIDERSHIP STATISTICS FROM GRAPH BELOW -ADJUSTED FOR 6 DAYS	
9,640,000	AVERAGE PASSENGERS FALL-WINTER 2019 PEAK BEFORE PANDEMIC
370,769	PASSENGERS PER WEEKDAY DAY 1/30 UNLINKED (WEIGHTED X 50% SAT & SUN)
47.6	MILES OF ROUTE
7,789	PASSENGERS PER MILE / DAY UNLINKED
ESTIMATED HIGHROAD RAIL UNLINKED RIDERSHIP BASED ON ABOVE -7-DAY WEEKS	
26,000,000	AVERAGE PASSENGERS ESTIMATED AFTER FULL OPERATION 2037
1,174,570	PASSENGERS PER DAY 1/30 UNLINKED
365	MILES OF ROUTE
3,218	PASSENGERS PER MILE / DAY UNLINKED USED IN FUTURE CAPACITY CALCULATIONS



ACTUAL RAIL RIDERSHIP MARTA 2019 - 2020				
SEPT.	9.5	MILLION	47.6	TRACK MILES
OCT.	10.9	MILLION	47.6	TRACK MILES
NOV..	9.6	MILLION	47.6	TRACK MILES
DEC.	8.7	MILLION	47.6	TRACK MILES
JAN..	9.5	MILLION	47.6	TRACK MILES
	48.2	MILLION		
AVERAGE	9.64	MILLION	IN 2019 FALL-WINTER	
7-DAY WI	321,333	RIDERS	6,751	PER TRACK MILE
6-DAY WI	401,667		8,438	PER TRACK MILE
USED FOR 2019 EST RIDERSHIP			5,468	PER TRACK MILE

TABLE R2 - NEW YORK CITY (5 BOROUGHS) REGION TRANSIT RIDERSHIP ANALYTICS 2019

STATISTICAL ANALYSIS BASED ON PROPORTIONAL ARC POPULATION RECORDS UPDATED FROM NYC MPO

	3,200	HIGHROAD PASSENGERS PER 2-WAY MILE / DAY ATLANTA FEASIBLE PLANNING STANDARD INITIALLY, WITH CAPACITY TO GROW X 10 TO 20 TIMES				
DATA ANALYZED	**23,899**	ACTUAL OFFICIAL FTA MTA HEAVY RAIL UNLINKED RAIL PASSENGERS PER 2-WAY TRACK- MILE / DAY				
1. NYC MPA BASIC DATA:	**CITY TOTAL**	**BRONX**	**BROOKLYN**	**MANHATTAN**	**QUEENS**	**STATEN I.**
AREA, SQUARE MILES	302.64	42.1	22.83	70.82	108.53	58
POPULATION (2019)	7,796,532	877,922	2,559,903	1,628,706	2,253,858	476,143
POPULATION DENSITY / SQ. MI.	25,762	20,853	112,129	22,998	20,767	8,157
2. MTA RAIL CURRENT SERVICE	**CITY TOTAL**	**BRONX**	**BROOKLYN**	**MANHATTAN**	**QUEENS**	**STATEN I.**
POPULATION SHARE USING RAIL	70.504%	51.064%	46.504%	189.858%	33.848%	0.00%
FTA OFFICIAL RIDERS / WEEKDAY 2019	5,496,875	448,301	1,190,461	3,092,234	762,880	0
UNLINKED RIDERS PER MILE OF ROUTE (AVG)	23,899	13,585	14,172	43,553	18,164	0
2019 MILES OF MTA RAIL ROUTE (NYC MPA)	230.00	33.0	84.0	71.0	42.0	0.0

1. THIS SPREADSHEET IS TO CALCULATE THE NUMBER OF PASSENGERS PER ROUTE MILE PER DAY ON NYC'S TRANSIT RAIL SYSTEM.
2. THE NYC PASSENGERS PER ROUTE MILE PER DAY WILL BE CONSIDERED AS A CRITERIA FOR SIMILAR RIDERSHIP IN ATLANTA.
3. THE NYC POPULATION DENSITY WILL BE CONSIDERED AS A CRITERIA FOR PROPORTIONAL RIDERSHIP IN ATLANTA.
4. MARTA RAIL VEHICLE SPEEDS, USING EQUIVALENT FARE RATE OF $0.35 PER MILE, OPERATING HOURS, AND SERVICE FREQUENCY.
5. THIS ANALYSIS IS FOR SERVICE AND CONSTRUCTION REQUIREMENTS COMPARISON ONLY.
6. MANHATTAN RIDERSHIP IS MORE THAN RESIDENT POPULATION DUE TO ITS UNIQUE USE AS THE REGION'S CENTER OF EMPLOYMENT.
7. BROOKLYN, QUEENS AND BRONX POPULATIONS ARE MORE SIMILAR TO ATLANTA'S BUT WITH GREATER POPULATION DENSITY.
8. ATLANTA'S NEED FOR TRANSIT IS GREATER THAN NEW YORKS DUE TO LONGER AVERAGE TRIPS NEEDED.
9. POPULATIONS OF ALL STUDIED AREAS ARE NON-FARMING AND REPRESENT A GENERALLY HOMOGENOUS NATIONAL POPULATION.

This ridership analysis is based on the 2019 FTA reporting data and official MPA statistics.
Calculations were simplified, and verified using Statistical Sampling of Large Homogeneous Populations.
Estimates and calculations prepared from FTA data and MPA data.
Estimates and calculations prepared by William E. Owen & Associates, Consulting Engineers & Planners Aug. 17, 2021.
Contact: 404-683-1331

	MILES OF HEAVY RAIL TRANSIT			
Borough	**Underground**	**Elevated**	**Other**	**Total**
Brooklyn	43	28	13	84
Bronx	12	18	3	33
Manhattan	67	4	0	71
Queens	15	20	7	42
Total	137	70	23	230

RIDERS PER DAY PER BOROUGH PER YEAR

	2014	2015	2016	2017	2018	2019
Brooklyn	1,210,086	1,227,391	1,226,715	1,213,998	1,188,606	1,190,461
Bronx	486,783	488,379	490,877	481,267	451,214	448,301
Manhattan	3,103,039	3,130,437	3,128,188	3,100,902	3,042,005	3,092,234
Queens	797,420	804,251	809,903	784,312	755,778	762,880
Systemwide Adjustment	223	152	72	366	-17	
System Total	**5,597,551**	**5,650,610**	**5,655,755**	**5,580,845**	**5,437,586**	**5,493,875**

TABLE R3 - WASHINGTON DC REGION TRANSIT RIDERSHIP ANALYTICS 2019

STATISTICAL ANALYSIS BASED ON PROPORTIONAL ARC POPULATION RECORDS UPDATED FROM FTA SEPT. 2019

	3,200	HIGHROAD PASSENGERS PER 2-WAY MILE / DAY INITIALLY, WITH CAPACITY TO GROW X 10 TIMES	
DATA ANALYZED	6,600	ACTUAL OFFICIAL FTA WMATA RAIL PASSENGERS PER 2-WAY TRACK- MILE / DAY (FTA) UNLINKED	
1. WMATA MPO BASIC DATA 2019:	**DC REGION**	**DC**	
AREA, SQUARE MILES	**6567.6**	**68.3**	
POPULATION (2019)	**5,264,000**	**705,749**	
POPULATION DENSITY / SQ. MI.	**802**	**10,333**	
2. WMATA RAIL CURRENT SERVICE	**DC REGION**	**DC**	
POPULATION SHARE USING RAIL	**14.669%**	**35.535%**	**CALCULATED**
MPO OFFICIAL RIDERS / WEEKDAY 201	**772,157**	**250,786**	**CALCULATED**
RIDERS PER DAY / MILE OF ROUTE	**6,600**	**6,600**	**BASIS**
2019 MILES OF MTA RAIL WIKIPEDIA	**117.00**	**38.0**	

1. THIS RIDERSHIP IS BASED ON PASSENGERS USING RAIL EACH DAY FOR 2 TRIPS (1 ROUND TRIP).

1. THIS SPREADSHEET IS TO CALCULATE THE NUMBER OF PASSENGERS PER ROUTE MILE PER DAY ON WMATA'S TRANSIT RAIL SYSTEM.

2. THE WMATA PASSENGERS PER ROUTE MILE PER DAY WILL BE CONSIDERED AS A CRITERIA FOR SIMILAR RIDERSHIP IN ATLANTA.

3. THE WMATA POPULATION DENSITY WILL BE CONSIDERED AS A CRITERIA FOR PROPORTIONAL RIDERSHIP IN ATLANTA.

4. MARTA RAIL VEHICLE SPEEDS, USING EQUIVALENT FARE RATE OF $0.35 PER MILE, OPERATING HOURS, AND SERVICE FREQUENCY.

5. THIS ANALYSIS IS FOR SERVICE AND CONSTRUCTION REQUIREMENTS COMPARISON ONLY.

6. POPULATIONS OF ALL STUDIED AREAS ARE NON-FARMING AND REPRESENT A GENERALLY HOMOGENOUS NATIONAL POPULATION.

This ridership analysis is based on the 2019 FTA reporting data and official MPA statistics.

Calculations were simplified, and verified using Statistical Sampling of Large Homogeneous Populations.

Estimates and calculations prepared from FTA data and MPA data.

Estimates and calculations prepared by William E. Owen & Associates, Consulting Engineers & Planners

Contact: 404-683-1331

The Atlanta Region is comparable in population with the Washington, D.C. transit system , with its 91 miles of service track and 117 stations. The Washington rail system moves 772,157 riders per day or 6,600 riders per mile per day, compared to Atlanta's HighRoad prediction of 3,216 riders per day. Commuters have a major influence on travel patterns, with only 28% of people employed in Washington, D.C. commuting from within the city, whereas 33.5% commute from the nearby Maryland suburbs, 22.7% from Northern Virginia, and the rest from Washington, D.C.'s outlying suburbs, similar to the Atlanta pattern. Atlanta's region is 5,872 square miles compared to Washiington's 6,567 square miles. Atlanta's density is 902 in 2019 while Washington's is 802. In 2040 Atlanta's density is expected to be 1,261. All this data supports the calculations of ridership made ☑upporting a 329-mile HighRoad transit system for Atlanta in 2040.

TABLE R4 - PHILADELPHIA - SEPTA REGION TRANSIT RIDERSHIP ANALYTICS 2019

STATISTICAL ANALYSIS BASED ON ARC & SEPTA MP0 DATA

	3,200	HIGHROAD PASSENGERS PER 2-WAY MILE / DAY INITIALLY, WITH CAPACITY TO GROW X 10 TIMES
DATA ANALYZED	8,005	ACTUAL OFFICIAL FTA SEPTA RAIL PASSENGERS PER 2-WAY TRACK- MILES / DAY (FTA) UNLINKED
1. SEPTA MPA BASIC DATA:	**PHILA - SEPTA**	
AREA, SQUARE MILES 2020	**1981**	
POPULATION (2019)	**5,704,994**	
POPULATION DENSITY / SQ. MI.	**2,880**	
2. MTA RAIL CURRENT SERVICE	**PHILA - SEPTA**	
POPULATION SHARE USING RAIL	**5.150%**	**CALCULATED**
FTA OFFICIAL RIDERS / WEEKDAY 2019	**293,800**	**CALCULATED**
RIDERS PER MILE OF ROUTE	**8,005**	**BASIS**
2019 MILES OF MTA RAIL (PHIL. MPO)	**36.70**	

1. RIDERSHIP IS BASED ON PASSENGERS USING RAIL TRANSIT EACH DAY FOR 2 TRIPS (1 ROUND TRIP).
2. THIS SPREADSHEET IS TO CALCULATE THE PASSENGERS PER ROUTE MILE PER DAY ON PHILADELPHIA'S SEPTA SYSTEM.
3. THE SEPTA RIDERS PER ROUTE MILE PER DAY ARE GREATER THAN ATLANTA'S MARTA WITH SIMILAR TRACK MILES.
4. MARTA RIDERSHIP AT LOWER DENSITY THAN PHILADELPHIA SUPPORTS HIGHROAD RIDERSHIP ANALYSIS.
5. PHILADELPHIA RIDERSHIP IS LOW DUE TO ITS LACK OF MILES OF TRACK AVAILABLE FOR USE.
6. PHILADELPHIA NEEDS MORE TRANSIT SINCE IT GREATLY UNDERSERVES THE REGION, DESPITE ITS POPULATION.
7. ATLANTA'S NEED FOR TRANSIT IS SIMILAR TO PHILADELPHIA'S DUE TO MUCH MORE SERVICE NEEDED.
8. COMPARED POPULATIONS ARE NON-FARMING AND REPRESENT A HOMOGENOUS NATIONAL POPULATION.

This ridership analysis is based on the 2019 FTA reporting data and official MPO statistics.
Calculations were simplified, and verified using Statistical Sampling of Large Homogeneous Populations.
Estimates and calculations prepared from FTA data and MPO data.

Contact: 404-683-1331 **William E. Owen & Associates, Consulting Engineers & Planners**

TABLE R5 - CHICAGO REGION TRANSIT RIDERSHIP ANALYTICS 2019

STATISTICAL ANALYSIS BASED ON ARC POPULATION & RECORDS FROM CHICAGO MPO

	3,281	HIGHROAD PASSENGERS PER 2-WAY MILE / DAY ATLANTA FEASIBLE PLANNING STANDARD INITIALLY, WITH CAPACITY TO GROW X 10 TIMES
DATA ANALYZED	3,160	ACTUAL OFFICIAL FTA MPO HEAVY RAIL UNLINKED RAIL PASSENGERS PER 2-WAY TRACK- MILE / DAY
1. CHICAGO MPO BASIC DATA:	**CITY TOTAL**	
AREA, SQUARE MILES	3,750	
POPULATION (2019)	9,457,867	
POPULATION DENSITY / SQ. MI.	2,522	
2. CHICAGO RAIL CURRENT SERVICE	**CITY TOTAL**	
POPULATION SHARE USING RAIL	7.487%	CALCULATED
FTA OFFICIAL RIDERS / WEEKDAY 2019	708,154	CALCULATED
UNLINKED RIDERS PER MILE OF ROUTE (AVG)	3,160	BASIS
2019 MILES OF MTA RAIL ROUTE	224.10	

3. NOTE HIGHROAD'S STABLE RIDERSHIP IS SIMILAR TO CHICAGO'S ACTUAL RAIL RIDERS EACH DAY FOR 2 TRIPS (1 ROUND TRIP)

4. THE CHICAGO POPULATION DENSITY WILL BE CONSIDERED AS A CRITERIA FOR PROPORTIONAL RIDERSHIP IN ATLANTA.

5. MARTA RAIL VEHICLE SPEEDS, FARE RATE OF $0.35 PER MILE, OPERATING HOURS, AND SERVICE FREQUENCY ARE BASES.

6. THIS ANALYSIS IS FOR SERVICE AND CONSTRUCTION REQUIREMENTS COMPARISON ONLY.

7. CHICAGO RIDERSHIP IS LOW DUE TO ITS LACK OF MILES OF TRACK AVALABLE FOR USE.

8. CHICAGO NEEDS MORE TRANSIT MILES SINCE IT GREATLY UNDERSERVES THE REGION, DESPITE ITS POPULATION.

9. POPULATIONS OF ALL STUDIED AREAS ARE NON-FARMING AND REPRESENT A GENERALLY HOMOGENOUS NATIONAL POPULATION.

This ridership analysis is based on the 2019 FTA reporting data and official MPO statistics.

Calculations were simplified, and verified using Statistical Sampling of Large Homogeneous Populations.

Contact: 404-683-1331 William E. Owen & Associates, Consulting Engineers & Planners

	WEEKDAYS	SAT	SUN	ANNUAL TOTAL
CHICAGO RAIL LOOPS 2019 TOTAL	708,154	397,346	296,997	218,664,530

TABLE R6 - COMPARATIVE RAIL DATA FOR 5 LARGE AMERICAN CITY REGIONS

Data below is from regional MPO's, Local Transit agencies, FTA, and APTA for 2019.

CITY REGION SYSTEM	DENSITY OF SERVED AREA POP. / SQ. MI.	ROUTE MILES	REGION / COUNTY POPULATION (YEAR NOTED)	WEEKDAY TRIPS	TOTAL ANNUAL WEEKDAY TRIPS	WEEKDAY TRIPS / ROUTE MILE	POPULATION SHARE USING RAIL (YEAR NOTED)	YEAR NOTED
TRACK MILEAGE DESCENDING FROM TOP								
	DENSITY	**MILES**	**POPULATION**	**2019 W/D TRIPS**	**ANN. W/D TRIPS**	**TRIPS / MILE**	**POPULATION'S TRIPS SHARE**	**DATE OF DATA**
ATLANTA HIGHROAD* 2040	1,261	329.0	7,406,223	1,079,383	280,639,580	3,281	14.57%	2040
NEW YORK CITY 2019	25,762	230.0	2,559,903	5,496,875	1,429,187,500	23,899	214.73%	2019
BRONX	20,853	33.0	877,922	448,301	116,558,168	13,585	51.06%	2019
BROOKLYN	112,129	84.0	2,559,903	1,190,461	309,519,856	14,172	46.50%	2019
MANHATTAN	22,998	71.0	1,628,706	3,092,234	803,980,744	43,553	189.86%	2019
QUEENS	20,767	42.0	2,253,858	762,880	198,348,688	18,164	33.85%	2019
CHICAGO 2019	2,522	224.1	9,457,867	708,154	184,120,040	3,160	7.49%	2019
WASHINGTON D.C. 2019	802	117.0	5,264,000	772,157	200,760,820	6,600	14.67%	2019
ATLANTA REGION 2019**	901	47.6	5,290,159	260,273	67,670,980	5,468	4.92%	2019
FULTON	1,992	38.6	1,063,937	211,064	54,876,594	5,468	19.84%	2019
DEKALB	2,665	9.0	722,161	49,208	12,794,093	5,468	6.81%	2019
COBB	2,148	0.0	741,000	0	0	0	0.00%	2019
GWINNETT	2,028	0.0	877,922	0	0	0	0.00%	2019
PHILADELPHIA 2019	2,880	36.7	5,704,994	293,800	76,388,000	8,005	5.15%	2019

SIMILAR ROUTE MILEAGE (SUBSETS OF REGION ABOVE)	With sufficient availability of rail track for a similar population the use-of-transit share increases. Accordingly, *Atlanta's ridership share would increase as HighRoad route miles are added and
SIMILAR ROUTE DENSITY (SUBSETS OF REGION ABOVE)	With sufficient density and availability of rail track for a population, the use-of-transit share increases. Accordingly, **Atlanta's ridership share would increase as HighRoad route miles are added, even with low density due to the need for fast alternatives to automobile or bus availability.

NOTE 1: ATLANTA'S REGIONAL POPULATION IS UNDERSERVED AND GROWTH EXPECTED (ARC) WILL CREATE HUGE PROBLEMS.
NOTE 2: FULTON COUNTY (ATLANTA) ACTUAL 3019 POPULATION USAGE EXCELS AT SHARE OF 19.838% OF COUNTY POPULATION.
NOTE 3: ALL OTHER ATLANTA COUNTIES ARE AT PRESENT IN 2021 ARE UNDERSERVED.
NOTE 4: NEW YORK HAS RELATIVELY FEW AUTOMOBILES DUE TO OWNERSHIP COSTS AND MUST USE 4X RAIL AND BUS TRANSIT.
NOTE 5: WASHINGTON DC HAS RIDERSHIP PER MILE SIMILAR TO ATLANTA FOR MORE MILES AT STABLE LOWER RIDERS PER MILE.
NOTE 6: PHILADELPHIA HAS LOW POPULATION SHARE USING RAIL AND NEEDS TO ADD RAIL SERVICE.
NOTE 7: CHICAGO HAS LOW POPULATION SHARE USING RAIL AND NEEDS TO ADD RAIL SERVICE.
NOTE 8: DENSELY-POPULATED TRACK MILES HAVE MORE STATIONS THAN SPARSELY-POPULATED TRACK MILES.
NOTE 9: DENSELY-POPULATED REGIONS NEED MORE STATIONS TO MAKE RAIL ACCESS EASIER, INCREASING EQUITABLE USAGE %.

TABLE R7 - COMPARATIVE RAIL TRANSIT SYSTEMS AND CARS FOR CONSTRUCTION COSTS, AIRBORNE CONTAMINANTS, NOISE, CONGESTION, CONVENIENCE AND EFFECTIVE SPEED.

COMPARISONS OF MODES OF TRANSIT - WITH "BEST" OF FIELD SHOWN WITH YELLOW

SPECIFICATIONS	HIGHROAD	MARTA RAIL	LIGHT RAIL	BRT	PRIVATE CARS	PODS SPEC.
DESIGN TOP SPEED - MPH	85	70	70	55	55	UNSTATED (40 EST)
AVG.SPEED	42.1	35.6	22.2	22.2	26	UNSTATED (19.8 EST)
PASSENGERS	150	100	90	90	1.2	1 TO 4 (1.2)
MAX PAX / HOUR / MILE	5,160	5,160	2,580	2,064	2,400	2,400
BRAKES	28.6 FPS/S (CALC.)	14 FPS/S (EST.)	14 FPS/S (EST.)	14 FPS/S (EST.)	17 FPS/S (EST.)	NOT STATED
NOISE CREATED BY	"QUIET RAIL" USED	CROWN & FLANGE	CROWN & FLANGE	TIRES, ENGINES	TIRES	NOT STATED
FUEL	ELECTRICITY	ELECTRICITY	ELECTRICITY	DIESEL	GASOLINE	SOLAR / ELECTRIC
AIR POLLUTION	NONE	NONE	NONE	TIRES, ENGINES	TIRES, ENGINES	NONE
SUBSIDY TAX NEEDED	NONE	YES	YES	YES	NONE	NOT STATED
FARE $ / MILE (APPROX.)	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.56	NOT STATED
DRIVERLESS	YES	NO	NO	NO	NO	YES
SYSTEM FARE CARDS	NO	YES	YES	YES	NO	NOT STATED
DEBIT/CREDIT-CARDS	YES	NO	NO	NO	YES	NOT STATED
ENCLOSED STATIONS	YES	NO	NO	NO	N/A	YES
SPACING OF STOPS	1.25 MILES	1.25 MILES	UNDER 1.25 MI.	UNDER 1.25 MI.	N/A	UNDER 1.25 MILES
FOOD VENDING	YES	UNKNOWN	NO	NO	N/A	YES
UBER OPTION IN PLAN	YES	UNKNOWN	UNKNOWN	NO	N/A	NOT STATED
BUILD COST/MILE	$ 55,000,000	$ 250,000,000	$ 125,000,000	$ 30,000,000	N/A	NOT STATED
CREATES CASH SURPLUS	YES	NO	NO	NO	N/A	NOT STATED
PAYS FOR CONSTRUCTION	YES	NO	NO	NO	N/A	NOT STATED
MEETS FTA ESCAPE STD.	YES	YES	YES	YES	N/A	NO

1. BRAKE STANDARD IS FROM FEDERAL DOT VEHICLE MINIMUM BRAKING STANDARDS
2. OCCUPANCY STANDARD FROM INDUSTRY REPORTS
3. MARTA INFORMATION FROM MARTA REPORTS PUBLISHED BY APTA USING FTA SOURCES.
4. DEBIT/CREDIT CARDS ISSUED BY CARD PROVIDER & PROCESSED BY CARD PROVIDER FROM HIGHROAD OPERATOR OPERATIONS DATA.

TABLE R8 - REGIONAL POPULATION GROWTH 2020 TO 2040 BASED ON OTG & ARC ESTIMATES - 2010-2020 (MODIFIED)						47.6	3,218	0.19838
YEAR	REGION % (AVERAGE) PER ARC END OF YEAR GROWTH REPORTS	REGION POPULATION CONSERVATIVE GROWTH ESTIMATES BY OTG	% OVER 2019	HR MILES NEED @ 19.838% & 3281 / MILE PER OTG		REGION'S % PER ARC	REGION POPULATION PER ARC GROWTH ESTIMATES	% OVER 2019	HR MILES NEED @ 19.838% & 3,281/ MILE PER ARC
2050	1.335%	6,982,535	50.86%	430.4		1.335%	7,000,775	47.77%	431.6
2049	1.335%	6,890,527	48.87%	424.8		1.335%	6,908,526	46.43%	425.9
2048	1.335%	6,799,731	46.91%	419.2		1.335%	6,817,493	45.10%	420.3
2047	1.335%	6,710,131	44.98%	413.7		1.335%	6,727,659	43.76%	414.7
2046	1.335%	6,621,712	43.07%	408.2		1.335%	6,639,009	42.43%	409.3
2045	1.335%	6,534,458	41.18%	402.8		1.335%	6,551,527	41.09%	403.9
2044	1.335%	6,448,354	39.32%	397.5		1.335%	6,465,198	39.76%	398.6
2043	1.335%	6,363,384	37.49%	392.3		1.335%	6,380,006	38.42%	393.3
2042	1.335%	6,279,534	35.67%	387.1		1.335%	6,295,937	37.09%	388.1
2041	1.335%	6,196,789	33.89%	382.0		1.335%	6,212,976	35.75%	383.0
2040	1.335%	6,115,134	32.12%	377.0		1.335%	6,131,108	34.41%	378.0
2039	1.335%	6,034,555	30.38%	372.0		1.335%	6,050,319	33.08%	373.0
2038	1.335%	5,955,038	28.66%	367.1		1.335%	5,970,594	31.74%	368.1
2037	1.335%	5,876,569	26.97%	362.3		1.335%	5,891,919	30.41%	363.2
2036	1.335%	5,799,133	25.29%	357.5		1.335%	5,814,282	29.07%	358.4
2035	1.335%	5,722,718	23.64%	352.8		1.335%	5,737,667	27.74%	353.7
2034	1.335%	5,647,310	22.01%	348.1		1.335%	5,662,062	26.40%	349.0
2033	1.335%	5,572,896	20.41%	343.5		1.335%	5,587,454	25.07%	344.4
2032	1.335%	5,499,462	18.82%	339.0		1.335%	5,513,828	23.73%	339.9
2031	1.335%	5,426,996	17.25%	334.6		1.335%	5,441,172	22.40%	335.4
2030	1.335%	5,355,485	15.71%	330.1		1.335%	5,369,474	21.06%	331.0
2029	1.335%	5,284,916	14.18%	325.8		1.335%	5,298,721	19.73%	326.6
2028	1.335%	5,215,277	12.68%	321.5		1.335%	5,228,900	18.39%	322.3
2027	1.335%	5,146,555	11.20%	317.3		1.335%	5,159,999	17.06%	318.1
2026	1.335%	5,078,739	9.73%	313.1		1.335%	5,092,006	15.72%	313.9
2025	1.335%	5,011,817	8.28%	309.0		1.335%	5,024,909	14.39%	309.8
2024	1.335%	4,945,776	6.86%	304.9		1.335%	4,958,696	13.05%	305.7
2023	1.335%	4,880,606	5.45%	300.9		1.335%	4,893,355	11.71%	301.7
2022	1.335%	4,816,295	4.06%	296.9		1.335%	4,828,876	10.38%	297.7
2021	1.335%	4,752,830	2.69%	293.0		1.335%	4,765,246	9.04%	293.8
2020	1.335%	4,690,203	1.34%	289.1		1.335%	4,702,454	7.71%	289.9
2019	1.335%	4,628,400		285.3		1.600%	4,628,400	6.37%	ARC
2018	1.335%	4,555,900		280.9		1.591%	4,555,900	4.77%	ESTIMATE
2017	1.335%	4,495,065		277.1		1.591%	4,483,416	3.18%	ESTIMATE
2016	1.335%	4,435,043		273.4		1.591%	4,412,084	1.59%	ESTIMATE
2015	1.335%	NO DATA					NO DATA	ARC BASE	

NOTE 1: REGIONAL MILEAGE DEPENDS ON TOTAL REGIONAL POPULATION AND THE USE OF COUNTY ROADS WHILE PASSING THROUGH THE COUNTY THAT COULD BE REDUCED BY USE OF HIGHROAD.

NOTE 2: POPULATION GROWTH RATE IS MORE IN OUTER COUNTIES, BUT ITS TRAFFIC PASSES THROUGH NEIGHBORS.

NOTE3: CURRENT NEED IN 2020, INCLUDES 47.6 MILES PROVIDED BY MARTA, LEAVING 200.1 MILES REMAINING TO BE SUPPLIED BY HIGHROAD. AGREES GENERALLY WITH ANALYTICS WORKSHEET.

TABLE R9 - HEAVY RAIL RIDERSHIP PER MILE & DENSITY OF LARGE AMERICAN CITIES - 2017

UNLINKED BOARDINGS		SOURCE: WIKIPEDIA 4Q 2017 (from APTA)								
CITY	2017 UNLINKED RIDERS & 2040 ESTIMATE ATLANTA	RANK BY RIDERS	DAILY AVG RIDERS 365 DAYS ESTIMATED	TRACK MILES RANK	TRACK MILES	POP/ SQ. MILE RANK	POP. / SQ. MILE	DAILY AVG RIDERS / MILE	TRACK MILES JUSTIFIED IF MARTA ACTUAL DENSITY RIDERS/ MILE	TRACK MILES JUSTIFIED IF HIGHROAD AFFORDABLE DENSITY 3,218 RIDERS/ MILE
NEW YORK CITY	2,750,527,400	1	7,535,692	2	245	1	25,762	30,758	1,378	2,342
ATL REGION 2040	445,467,170	1.5	1,220,458	1	372	5	901	5,468	223	379
CHICAGO	238,645,800	2	653,824	5	102.8	4	2,522	6,360	120	203
WASHINGTON	234,232,100	3	641,732	3	117	6	802	5,485	117	199
BOSTON	172,105,800	4	471,523	7	38			12,408	86	147
SAN FRANCISCO	135,310,700	5	370,714	4	112			3,310	68	115
PHILADELPHIA	94,209,100	6	258,107	8	36.7	3	2,880	7,033	47	80
PATH, NY CITY	78,553,600	7	270,900	11	13.8			19,630	50	84
ATLANTA 2017	72,000,000	8	260,273	6	47.6	2	4,657	5,468	48	81
LOS ANGELES	45,863,900	9	125,655	9	17			7,222	23	39
BALTIMORE	11,241,200	10	30,798	10	15.5			1,987	6	10

NOTE 1: ATLANTA REGION HIGHROAD IS THE ONLY SYSTEM THAT DOES NOT REQUIRE SUBSIDIES YET WILL MOVE THE 2ND LARGEST NUMBER OF PASSENGERS PER DAY. IT PROVIDES THE BEST TRANSIT PLAN IN THE U.S.A.

NOTE 2: HIGHROAD HAS MORE MILES OF TRACK AND CAN REACH A LARGER SHARE OF ITS PEOPLE THAN ANY OTHER USA CITY REGARDLESS OF DENSITY OR FUNDING. THE ATLANTA REGION IS NOT WATER-BOUNDED AND LOWER-COST LAND IS AVAILABLE FOR CITIZENS.

NOTE 3: HIGHROAD IS MUCH MORE AFFORDABLE AND WILL NEED ONLY LOW POPULATION DENSITY, ALLOWING LONGER TRIPS AVAILABLE FOR RIDERS TO REACH MORE DESTINATIONS FASTER AND AT LOWER COSTS BY ANY OTHER MODE. MORE MILES OF TRACK MEANS MORE FAIRNESS TO ALL CITIZENS!

NOTE 4: HIGHROAD'S LOWER COST PER MILE ALLOWS IT TO BE THE ONLY SYSTEM THAT SHOULD QUALIFY AS THE BEST USE OF CAPITAL FOR THE NATION, AND BECAUSE ATLANTA HAS BEEN LEFT OUT OF NEW STARTS FOR MUCH TOO LONG.

NOTE 5: ALL SYSTEMS LISTED ABOVE EXCEPT HIGHROAD ARE HEAVY RAIL AT $250 MILLION / MILE OR MORE. HIGHROAD AT ABOUT $56 MILLION A MILE OFFERS EQUAL OR GREATER SERVICE CAPACITY THAN ALL OTHER HEAVY RAIL TECHNOLOGY.

TABLE R10 - HEAVY RAIL RIDERSHIP PER STATION USE IN LARGE AMERICAN CITIES - 2017

CITY	2017 UNLINKED RIDERS	STATION RIDERSHIP RANK	DAILY AVERAGE RIDERS / STATION	RIDERS / STATION RANK	STATIONS	STATION SEPARATION RANK	STATION SEPARATION MILES
NEW YORK CITY	2,750,527,400	1	30,758	2	472	2	0.52
ATL REGION (PLANNED)	445,467,170	2	4,180	9	292	8.5	1.27
CHICAGO	238,645,800	3	6,360	8	146	3	0.70
WASHINGTON	234,232,100	4	5,485	6	91	9	1.29
BOSTON	172,105,800	6	12,408	3	53	4	0.72
SAN FRANCISCO	135,310,700	7	3,310	4	46	10	2.43
PHILADELPHIA	94,209,100	5	7,033	10	75	1	0.49
PATH, MANHATTAN	78,553,600	11	19,630	1	13	5	1.06
ATLANTA 2 COUNTIES	72,000,000	8	6,849	7	38	8.0	1.25
LOS ANGELES	45,863,900	9	7,222	5	16	6	1.09
BALTIMORE	11,241,200	10	1,987	11	14	7	1.11

NOTE 1: HIGHROAD HAS MORE MILES OF TRACK AND THEREFORE WITH MORE STATIONS, ALLOWIING IT TO REACH A LARGER SHARE OF ITS REGIONAL PEOPLE THAN ANY OTHER USA CITY REGARDLESS OF DENSITY OR FUNDING EXCEPT NEW YORK'S MANHATTAN BOROUGH. IT HAS LOW DENSITY AND THAT MATCHES THE PEOPLE'S NEEDS BY BEING READILY AVAILABLE BECAUSE IT IS NOT WATER-BOUNDED AND LOWER-COST LAND IS AVAILABLE FOR CITIZENS' HOMES, ALLOWING MORE SPACE . YET BECAUSE IT IS EFFICIENT IN DESIGN AND OPERATION IT ALLOWS LONGER TRIPS FOR RIDERS TO REACH MORE POTENTIAL DESTINATIONS FASTER AND AT LOWER UNSUBSIDIZED COSTS BY ANY OTHER MODE, PROVIDING MORE SERVICE TO THE PUBLIC.

NOTE 2: HIGHROAD'S LOWER COST PER MILE ALLOWS IT TO BE THE ONLY SYSTEM THAT SHOULD QUALIFY AS THE BEST USE OF CAPITAL FOR THE NATION AND ATLANTA HAS BEEN LEFT OUT OF NEW STARTS FOR MUCH TOO LONG.

NOTE 3: ADDING MORE STATIONS WILL SLOW THE AVERAGE SPEED OF THE ATLANTA HIGHROAD SYSTEM, RAISE ITS FARE NEEDS, AND ULTIMATELY PROVIDE LESS SERVICE. THIS IS OFFSET BY THE FIRST-MILE / LAST-MILE TAXI SERVICE PROVIDED BY HIGHROAD. MARTA AND HIGHROAD USE THE SAME STATION SPACING.

TABLE R11 - LOGIC: STUDY METHOD FOR FORECASTING HIGHROAD HEAVY RAIL RIDERSHIP FOR ATLANTA

A. Population Density Is a basis for ridership demand.

1. Fulton County and Dekalb County are bases for population density.
2. Fulton County is less dense than Cobb, DeKalb and Gwinnett.
3. Yet Fulton County has rail transit, DeKalb has little and Cobb and Gwinnett have none.
4. DeKalb, Cobb and Gwinnett need rail to be on a fairness par with Fulton.
5. MARTA rail serves 5,468 rail passengers / mile / day, proving ridership feasible.
6. HighRoad is successful at 3,281 passengers per mile per day, similar to San Francisco.
7. MARTA and San Francisco "service miles" justify needed HighRoad transit mileage.

B. Ridership demand as qualification for present needs.

1. HighRoad's capacity provides 7.8 x more service miles than MARTA rail .
2. HighRoad's capacity if at MARTA levels / mile would provide 7.82 x more trips / day.
3. HighRoad has low cost and high service, supporting many miles of HighRoad transit.
4. Funding for desired MARTA rail expansion is not expected, even from higher taxation.

C. Ridership capability as qualification for future expectations

1. ARC estimates predict about a 40% increase in Atlanta region population by 2040.
2. HighRoad can 10 x its beginning capacity by adding vehicles bought with fares.
3. HighRoad can meet the growth needs for many more people than can MARTA.

D. Financial feasibility and affordability at current needs and expected ridership.

1. Appendix B. Tables P1-P11 show analysis of the feasible 372-mile HighRoad Transit System.
2. Appendix B. Tables P1 through P4 show HighRoad's cash flow, operating costs, and net cash.
3. Present transit taxes are not sufficient to provide needed MARTA rail service growth.
4. Additional transit taxes would be a substantial burden on the people if enacted.
5. HighRoad ridership at 3,281 through 54,680 per mile is affordable, with no new taxes.
6. Records show that MARTA rail systems cost a minimum of $250 million a mile.
7. Engineering estimates show that HighRoad will cost about $56 million a mile (2021).

E. HighRoad can be started immediately.

1. Engineering is prepared, ready for construction drawings.
2. Financing is planned, ready for approval.
3. Routing can be quickly arranged by counties, with drafts already completed.
4. Supporting decisions by Governments are the only need.
5. The HighRoad engineering, manufacturing and construction team is ready to proceed.

PART C
HighRoad Heavy-Rail Transit System Environmental Reviews

A. Environmental Safety of workers during system construction:

1. Protection: Protection of the workers during construction is the purpose of the examination of the construction environment of the system, including the protection of the non-transit public during construction.

2. Run-off: All disturbance of soil at the site will be surrounded by silt fences as required by local codes to protect the surrounding area drainage paths from introducing water-borne soil into the water adjacent drainage system.

3. Falls: Falling risk harnesses & cables attached to the structure will be required by all workers who work at an elevation 6 feet or more above the pavement or ground level in accordance with OSHA requirements or as required for safety when no requirements are provided by OSHA.

4. Falling Materials: Workers & visitors will be required to wear hard-hats as required for their safety in zones identified as "hard-hat zones" and cautioned to not remain under work of construction.

5. Worker Respite: Rolling stages with rain covers & enclosed ladders will be provided to afford added work spaces adjacent to the lower working surfaces along and in the guideway to allow worker respite from cramped conditions and to have positions from which rail and power bar installations can be supplied and affixed.

6. Automated Supply: Electronic oversight and management of automated supply carriers on tops of completed guideways will be installed to assure timely supply of guideway segments to installation sites and return of empty segment carriers to casting yards.

7. Roadway Avoidance: Use roadway trucks and cranes only when necessary to avoid road risks and driver risks at times when delivery and placement of materials by use of a guideway is not available.

8. Power Placement of Segments: Place segments only with use of rolling gantry structures and lowering devices attached to the gantry, with use of actuators to move the lowering gantry structure to desired angles, and to lock the gantry in place for lowering segments. Use cranes to place segments only when a rolling gantry cannot fulfill the task. Remote control of these placements will reduce the risks to workers doing this work.

9. Chemical Risk Protection: Adhesives & mineral spirits needed for rail and power bars installation and adhesive clean-up, with risks from adhesive vapors, will be protected by skin & eye shields & 100% full-time outdoor fresh air in accordance with the Loctite adhesive product warning below. All protective clothing and shields will be provided to workers after intensive training by manufacturer's representatives. Safety instructions for using the adhesive are below:

PRECAUTIONS - DIRECTIONS

LOCTITE® PL® PREMIUM MAX Construction Adhesive
Revision: 01/22/2020 Supersedes: 04/09/2018 Ref. #: 601344
Refer to the Safety Data Sheet (SDS) for further information

WARNING: Contains Crystalline silica and silanes. May be harmful if inhaled or swallowed. Methanol is released during application and cure, which may affect the nervous system causing dizziness, headache, or nausea. Use in a well-ventilated area. Do not breathe vapors. Avoid eye and skin contact. Prolonged or repeated skin contact with uncured adhesive may cause an allergic reaction. Wear impermeable gloves and safety glasses when applying product. Remove contact lenses before using adhesive. Wash hands after using. FIRST AID: For eye contact flush with water for 15 minutes. Call a physician if irritation develops and persists. For skin contact, wash thoroughly with soap and water. If affected by inhalation, remove to fresh air and get medical attention. If ingested, do not induce vomiting; call a physician or Poison Control Center immediately. DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN. WARNING: Cancer and Reproductive Harm –www.P65Warnings.ca.gov.

a. Special Training: Training in use of the adhesives will be provided to assure first that no harm comes to the worker, and second to assure that the adhesive is applied adequately for the project.

b. Preparation of the adhesive: Since the adhesive is ready-to-use, the adhesive must only be kept at an acceptable temperature during storage and its work day.

c. Method of applying adhesives: While wearing gloves and face and skin protection, spread the adhesive with a stainless-steel tool to both sides of clean surfaces (rail bottom and concrete recess) and retain excess adhesive for continued application within the work time allowed. Do not discard excess or spoiled adhesive but save it in metal cans with airtight seals for later discarding in an approved manner.

d. Storage of adhesives. Store the adhesive in locked spaces that are constantly heated to maintain the adhesive containers at approved temperatures, with a primary purpose of assuring that no untrained or unauthorized person has access to the adhesive. Avoid storage at other temperatures since the adhesive may be spoiled by those conditions.

e. Disposal of adhesive containers: Verify proper method of disposal and follow the instructions with assistance from local waste removal officials while following appropriate law.

f. Disposal of Cleaning Material: Dispose of adhesive cleaning agents and paper wipers used in cleanup and save them in metal cans with airtight seals for later discarding in an approved manner: Verify proper method of disposal and follow the instructions with assistance from local waste removal officials while following appropriate law.

g. Cleaning Agents: Safe cleaning agents are to be used for cleaning steel and concrete for adhesive application. TSP or a TSP functionally equivalent is to be used to clean steel

rails and concrete rail beds and rinsed with clean water and then have adhesive applied. Manufacturer specifies adhesive cleanup with mineral spirits, a mildly flammable fluid. The mineral spirits are to be kept in airtight metal cans. All adhesive usage is to be outdoors in freely-moving fresh air.

h. Personal protection clothing, goggles and gloves: Workers will be schooled in use of the cleaning agents, adhesive, and cleanup materials to assure a safe work environment. Hazardous material will be kept locked away from the work site so that site intrusion will not be a hazard to unauthorized persons. Contaminated clothing and protection equipment will be retained or disposed of according to manufacturer's registered instructions.

B. Environmental Protection of Workers During System Operation.

1. Protection: Protection of the workers during operation is the purpose of the examination of the operating environment of the system, including the protection of the non-transit public during operation.

2. Avoiding risk: Use of drones and passenger vehicle photo-inspections for track condition maintenance reports will be used to avoid risk of injury to all personnel.

3. Stopped systems: No track repair will be done by workers unless the system is stopped and verified by at least 2 Supervisors. Workers will not be on the track unless that line is not in service and the line is locked out by action of two safety monitor persons in physical and sight proximity to each other and the repair location.

4. Worker training: Shop training will be provided prior to certifying a worker to be a vehicle technician for line operation and for vehicle maintenance. These functions of special importance for safety are:

(1) Hoists: Lifting and lowering of unoccupied transit vehicles will be controlled only by a trained expert.

(2) Electrical Training: Electrical service repairs on unoccupied transit vehicles and on the guideway by trained experts only. Electrical service feeder wiring installation and repairs to the feeder wires to the guideway will be by the electrical service provider only.

(3) Controls: Controls installation and repairs will be made only on unoccupied transit vehicles and by trained experts only.

5. Public Protection: The riding public will be protected during system operation with use of these safety and environmental standards.

6. Avoiding Hazards: Safety by design is a principal concept. Safety problems observed in older types of transit are avoided by design with HighRoad. Some of these are listed below.

7. Trackside: Safety walls with wide doors and matching wide vehicle doors at trackside can stop accidental and malicious intrusions onto tracks or guideway. This is correction of a problem that is worldwide with rail transit. With HighRoad it is resolved.

8. Safety Door Operation: Vehicle doors have vehicle-in-motion motion lockouts with mechanical releases for emergency opening if doors are not actuated to open when stopped.

9. Anti-virus hand-holds: Circular low-height type hand-holds are provided in HighRoad vehicles at multiple places in standing areas. This is a new concept in passenger protection that is a part of HighRoad transit innovation. The multiple grab points at mid-height are easier for passengers to access and easier for staff to clean on a regular basis. They also offer hand positions that are independent and are likely to prevent unwanted hand-touching for passengers

10. Anti-virus devices in air supplies: Ion-needle virus-killing electric devices in HVAC systems are to be on vehicles' air conditioning systems to clean all the air, including recirculated air, and also to be in stations' HVAC systems.

11. Filters: Powered air intakes with high-efficiency filters are combined with powered exhausts to clean outside and recirculated air to provide a clean environment.

12. Fire & Smoke detectors: Fire & smoke detectors with their controls on vehicles will cause an automatic stop, open doors, then call to Central Supervising Station which will then call fire and medical Responders.

13. Boarding Bridges: A passenger entry / egress no-gap bridge is deployed with each door opening so that all passengers will have a smooth door threshold floor and a full-gap covering for safety and comfort. It is automatically retracted when the doors are closed. This bridge also is deployed automatically at any stop and door-opening along the guideway.

14. System Police: Non-transit-system police, in and out of uniform, will be provided with no-cost transit passes for all days and all hours, and will be encouraged to ride the HighRoad transit system in their normal work and leisure activities. Their safe-environment maintenance function will be similar to that of Air Safety Marshals but provided through officer employees of community police and sheriff's offices, with full policing authority, highly trained for extra security. They are not transit police, and not assigned to patrol vehicles or stations. Also, cameras and listening devices are provided in vehicles for CSS alerts (and override of controls) for stopping of a vehicle remotely in a station while calling for additional rapid-response police, fire or medical support, addressable quickly to all passenger cabins in service.

15. Full Station Access: Stations will be available 24 hours daily for quick access of vehicles by police, fire or medical responders. The stations will be weather-enclosed and available to all for transit. Cameras and listening devices in stations will alert CSS personnel if an intervention is needed. Stations will be well-lighted with other transit riders in large common areas on the two (or three) floors with connecting elevators and escalators.

16. Station Passenger Access:

    a. HUBERT Access: HighRoad Uber-type Rail Transit Access describes a system in which limited taxi services are provided under full or partial financial support by the transit system. The effects of this service (origin to station and station to destination) will be to (1) increase use of the HighRoad transit system, (2) make transit a more seamless experience, similar to personal automobile use, and (3) reduce the need for parking

facilities at stations. This is supported by an initial judgment that 10% of the station arriving passengers per day, calculated from dividing boarding ridership of an average station (1,197,492 per day) by the number of stations (292) then each average station boardings would have 4,101 boardings per day and 4,101 arrivals per day.

b. TOD Access: Transit Oriented Development describes planning and construction by private builders and owners to create living quarters (apartments, hotels, nearby-houses) and desirable destinations to shorten first-mile / last-mile distances and thereby promote less use of roadways for access to transit stations while reducing time used for transit access, increasing the riders' trip speed and satisfaction with the transit-use process. This is not supported by calculations but is supported by its benefits to the FTA and its policy of supporting TOD as a benefit to transportation. The benefit to HighRoad riders is that by using HighRoad daily for two 10-mile trips at $3.50 per trip and 260 work-days the rider could save an approximate $4,180 per year from not using a second automobile at a reasonable cost estimate of as much as $6,000 per year. The savings could partially-support the cost of a home in a TOD.

c. Store Parking Access: Stores and similar destinations for public automobile access will gain from convenient locations of HighRoad stations, and will benefit from sharing their existing or planned parking arrangements with the public in the interest of increasing net business and profit from having more customers. As store parking spaces are reduced by some degree, then the stores will have more customers arriving through the transit station portal than are reduced by eliminating or sharing spaces with transit patrons, and stores will have a financial gain. This is supported by paragraph a. above showing that a substantial increase in the number of prospective customers for all the stores in the vicinity of the station would be a reasonable inducement for sharing of parking, a business model used for retail shopping malls and city squares. Additionally, since a HighRoad rider will have a "pause" option in his trip, stopping for accessing stores at other stations along the route will provide automobile convenience for a transit system, making it more attractive to riders and stores in the vicinity of stations.

17. Weather Protection: Weather protection is provided in stations for riders of buses, taxis, HighRoad and the general public as a safety zone, with safety for storms and protection from harsh weather at all times the stations are open.

18. Independent Seating: Independent 20-inch-wide independent (not bench) seating is provided to increase comfort of riders and to decrease unwanted touching by adjacent passengers, promoting an environment of safety and personal security. Also, seat row pitch is 36 inches in order to assure passengers of comfortable entering and exiting of seat rows. This compares favorably with current airliner passenger seating pitch in other than first-class or business-class cabins.

C. Non-passenger Environmental Protection: Protection of the non-transit public will result from transferring some auto ridership to rail transit, thereby reducing risks from highway congestion.

1. Roadway Air Pollution Reduction: Reduction of roadway vehicle exhaust gases and fuel vapors by up to 19% is possible, and in high-density locations may be exceeded, as in New York City. Gases considered to be seriously polluting are Carbon dioxide (CO2), Carbon

monoxide (CO), Nitrogen oxides (NOx), Sulfur dioxide (SO2, unburned hydrocarbon combustion Particulates such as Diesel smoke, and unburned Benzene (C6H6) in gasoline. These occur naturally in generating most transit fossil-fueled engine-driven vehicles' power from gasoline and diesel from vehicle exhausts in small quantities, and is also emitted from them as unburnt fuel.

a. Benzine: Benzene is a carcinogenic substance and high levels of inhalation can severely harm human health. They also evaporate from the fuel tank and nozzle when a vehicle fuel tank is filled at the gas station. By transferring up to 19% of a region's automobile traffic growth to rail transit, with a large part of its electrical power derived from safe hydropower as in Georgia and from safe nuclear power generation of electricity in Georgia as much as 19% of the fuel exhaust gases and evaporation from growth are transferred to clean-power electric energy systems used in the HighRoad vehicles.

b. Increasing Pollution: Without HighRoad being used to replace automobile and bus growth as Atlanta grows, the air quality will get progressively worse within the increasing population density of the service area, and the living environment of the Atlanta will get much worse, with no other affordable, effective and efficient solution available to governments.

c. Leakage: Leakage of oil and gasoline to the roadway surface and eventually to surface water streams and underground aquifers from a gasoline of Diesel engine can be avoided by the proportion (up to 19%) of the traffic growth transferred to HighRoad instead of passed on to a larger and increasing hydrocarbon auto and bus vehicle population.

d. Airborne Particles: Reduction of roadway airborne tire and dirt particles. Rubber particles from tire wear is seen as new tires on vehicles wear thin, and an outer tread thickness of 1/ 4 inch is removed over time. A 14-inch diameter tire with a six-inch wide tread and a tread lifetime of 50,000 miles, and driving 12,500 miles per year can amount to 66 cubic inches per car per year of rubber introduced into the atmosphere in one year. Based on a ridership of 1,000,000 cars per day that amounts to 66,000,000 cubic inches of rubber particulates per year removed from the air by the proposed HighRoad system in its first full year of service. At the same time dirt on the roadway is lifted to be airborne by the tires and spread into the environment by the air flow created by the passing automobiles. Reducing unneeded cars on roadways can keep dirt and tire particle pollutants away from human involvement with them. Up to 19% of this particulate pollution from new driver roadway trips can be avoided by use of HighRoad.

2. Roadway Noise: Roadway noise has been seen to be caused to a larger amount by the repeated flexing and slapping of vehicle rubber tires against pavement and to a lesser amount by vehicle engines, both including public hydrocarbon-fueled buses. Reduction of the total number of vehicles by as much as 19% of the travel growth being transferred to steel rail transit can reduce both sources of noise which are observed by Federal spending of vast funds on noise fences along interstate highways.

3. Electric Motor Noise: Since any HighRoad vehicle noise that emanates from the electric motors is bounded by concrete guideway coves and covered by the vehicle cabin on the

guideway open side, that source of noise is minimized, and the systems will be noise-friendly in primary and arterial roads as well as in Interstate highways. By using VFD (Variable Frequency Drive) electric motors a brushless design (quiet) is used that operates by a rotating magnetic field that varies the frequency to create an electrical power wave profile that can maintain torque even at low speeds, allowing all its power to be available at all times, and to also allow up to 200% of its original rpm for use in high-speed applications. Also, cooling blowers on motors are not needed since ram-air is used for dynamic cooling proportional to vehicle speed. Cabin noise from motors is reduced by heavy sound-reducing insulation on the guideway side of the cabin wall.

4. Wheel Noise: Standard light rail and heavy rail systems with flanged wheels and ground curved rail-tops are significant sources of present standard rail transit noise. HighRoad steel wheels that operate on flat steel tracks are quiet, and the design is called "Quiet-Rail". This is because (a) the HighRoad wheels have no scraping flanges required to keep the wheels on the tracks, approved by the U. S. Patent Office for the HighRoad three-wheel cantilever design, and (b) the HighRoad wheels have smooth wheel surfaces to match the smooth steel rails thereby creating little noise. By replacing automobile tires that presently move most of the transit public with the novel steel wheels of the HighRoad Quiet Rail design the environment and the passenger cabin will be made quieter.

5. Congestion & Collisions: Reduction of vehicle congestion and collisions will be due to possible larger gaps between vehicles when in slow-moving traffic, and from fewer stops-and-starts in traffic, providing fewer opportunities for collisions and reducing drivers' stress. See **Excel Workbook P. Project** Table P6 regarding separation of vehicles on roadway lanes as a function of automobile speed.

6. Station Access: First mile / last mile safety passenger service is to be provided with certified drivers for local public bus services and for contracted certified Lyft and Uber services. Public buses may be reassigned from routes replaced by HighRoad to provide station-to-station trips (laterals) and first / last mile paid service if approved by local government transit systems.

7. Non-Passenger Station Use: Enclosed stations with warm environments or air-conditioned comfort are provided for transit riders and transfer passengers awaiting pickup, or a weather sanctuary for non-transit public. Persons in the station at other times that are not transit patrons will be removed under trespassing laws and provided with public sanctuary by officials of the local jurisdictions. Chairs and benches will not be provided except for food service patrons within their leased spaces.

8. Lower Stress Environment: Stress-reduction can be a health advantage of the HighRoad system as a result of reducing routine personal driving trips and replacing them with HighRoad transit.

9. Personal Time Gained: Personal time used for daily travel can be reduced and contribute to more personal freedom by avoiding having non-obligated time consumed by driving activity that does not add to quality of life. An average 10-mile trip at rush hour at an average automobile speed of 26 mph can be reduced by using HighRoad at an average speed of 40 mph by a factor of 53%. A 30-minute trip automobile each way can be reduced to only slightly

more than a quarter-hour trip each way by using HighRoad, adding 30 minutes a day to free time. Longer distances can add greater time savings, and freedom from rush-hour congestion adds even more. Since fares will be based on only $0.35 per mile compared to auto costs of about $0.55 a mile, net trip costs will change downward by 36%. And with a worker's / driver's time valued at $15 an hour, the use of HighRoad for one 10-mile round trip per day would save about $1,875 for a year of 250 work days, adding to the savings from not owning an auto, useful for many quality-of-life improvements.

10. Other Roadway Traffic Effects: Up to 19% of the traffic growth (or even more, as evidenced in New York which has inadequate surface roads for the huge population density) expected up to and beyond 2040 will be moved 26 feet upward by HighRoad so there will be less conflict with current and newly-added congested surface traffic. It also will be a place for future growth traffic to be handled until even more high-cost toll-charge roadways are built to handle only a portion of the expected surface transportation growth.

11. Archeological Damage Potential: Since the system will use primarily pre-existing roadways and adjacent right-of-way for the path of HighRoad columns which already have been reviewed for original construction and widening through possible areas of archeological interest, there are expected to be few actual archeological sites affected. However, to assure that there are no such sites that might be damaged, the Archeology Departments of local universities will be contacted for their simultaneous review of the selected routes and changes to the routes when new potential archeological sites are discovered and preservation or avoidance is required. The financing plan has funding included for these studies and activity.

D. Americans with Disabilities Act (ADA) compliance:

1. Service: Some ADA passengers or those with infirmities needing approved assistance for transit will have it available upon approved application to a transit office in an identified station. A special UBER / Lyft vehicle can be provided on call (an appointment will not be needed) to take a person and an assistant to approved services (medical and other) that are accessible by joint use of HighRoad vehicles and UBER / Lyft vehicles. In some instances, a local bus transit vehicle with special features will be used for the trip. Trip costs are not expected to cost more than standard mileage charges for the trip. See **Excel Workbook P.** Table P8-Uber.

2. Convenience: Vehicles are designed to be roll-on / roll-off accessible for wheelchairs and similar mobility devices, and with self-holding wheelchair movement-limiting stops. Special tie-downs will not be supplied since those are normally needed only on buses, streetcars and heavy rail that suffer from high unbanked centrifugal forces on curves without tilting and with high linear forces from starting & braking human inputs. Static acceleration / deceleration restraints designed for 3.2 fps/s or more will be provided in the wheelchair spaces provided on each HighRoad vehicle. Smooth automatic starts & stops are designed into the HighRoad controls with computer inputs satisfactory to seated and standing occupants, and with tilting service for comfortably minimizing lateral forces from rounding curves. This type of controls technology is already FAA Certified for the Cirrus G2 airplane for emergency no-pilot-needed push-button landing, all autonomous operations, without human intervention.

3. Flat Thresholds: Station doorways will have flat thresholds for easy wheelchair and wide walking paths, following ADA guidelines.

4. Trackside Protection: Station trackside walls will be to 10 feet high or to ceilings to inhibit crossing and have automatic wide bi-parting doors that will open when a vehicle's matching open doors are opposite. Walls are to protect passengers from accidentally falling off a loading platform and to prevent passengers from having unauthorized access to the guideway.

5. Gap Covers: Boarding platforms and a vehicle's doorway floor flat thresholds with gap covers are designed into the doors and vehicle-boarding platform interface, extended when needed and retracted when not needed. The gap covers are also suitable for gap covering anywhere on a guideway and are automatically deployed in an emergency stop when doors open.

6. Toilets & Refreshment: Transit vehicles do not have toilet facilities, drinking water or food service. However, these are planned to be available on each boarding level (food service on lower levels only) of all stations, generally available each 5 minutes of travel along the route, with re-boarding available after delays without added costs. A rider leaving a vehicle after having completed only part of a trip will have a trip pause of up to an hour allowed in the fare system without charging an additional mileage-based fare. Exiting through a turnstile and re-entering through any turnstile will be counted as an approved pause in a completed trip.

F. Environmental Sustainability:

1. Maintenance: HighRoad is low cost to maintain, to quickly replace standard parts, and maintain high rates of vehicle availability. Management control will schedule maintenance to identify, maintain and replace deficient parts to prevent downtime and unreliable service. The maintenance procedures and record-keeping for vehicles is similar to that used by airlines.

2. Newer Technology: HighRoad has a simple design with newer technology based on plug-and-play parts replaceability. New technology lasts longer by use of electronic simple command modules (with redundant modules) as used on large airliners. Standard components allow multiple sources and competitive prices.

3. Low Fares: Low fares are planned to attract riders away from automobiles. It is not likely that autos will become less costly to buy or maintain for accessing work or homes, or have operation less stressful than HighRoad, consequently patrons are expected to prefer HighRoad.

4. Standard Components: Use of standard mass-production components while keeping the costs of proven reliable parts low will also allow standardized training for technicians, allowing a systematic approach to the management of the personnel and inventories required for efficient operation.

5. UBER / Lyft Charging: Recharging stations for UBER/Lyft taxis promotes sustained service due to ease of providing services to riders, also promoting regular users of basic longer transit usage.

6. Freedom from Increased Taxes: HighRoad and its riders don't need state or local or federal government taxation increases to sustain the system since it sustains itself from fares. Fares are then dependent on convenience to its riders, and they are in turn dependent on the quality of the service, a circular loop of performance that improves services and reduces total cost to riders. Communities will depend on continued improved transportation while at the same time the 80% of the public not using HighRoad will see need for more roadway improvements yet which are not affordable to government without massive tax increases. Example is New York City where personal automobile usage is nearly extinct due to congestion and costs, and transit ridership is extremely large.

7. Energy Efficiency: HighRoad vehicles are electrically-driven and are more efficient in operational conversion of power into motor torque. HighRoad vehicles are equipped with steel wheels which roll on steel rails, more efficient with lower rolling friction than buses with rubber tires. HighRoad vehicles are of lighter weight composite construction (lower mass to be moved and braked) that alternative ground-based rail systems of steel, designed for collision survival due to their manual controls limitations. HighRoad vehicles are redundantly-controlled by automation that is more reliable and failure-free than are manually-controlled rail systems. This lighter weight also is the result of avoidance of possible collisions by design since vehicles are on protected guideways away from ground-based hazards.

a. HighRoad Btu's: A HighRoad electric vehicle of 45,000 lbs. (1398 slugs), and using 1,200 horsepower, operating at 50% maximum output, would consume 447,600 Watts per hour, or 2,984 Watts per passenger for 150 passengers. Converting that to Btu's at 3.413 Btus per Watt, the consumption would be 10,146 Btu's per hour per passenger.

b. Heavy Rail Btu's: A comparable Heavy Rail electric vehicle of 100,000 lbs. (3,105 slugs) and the same horsepower (proportional to the weight and same load profile) with 200 passengers uses at 50% maximum output 132,620 Watts per hour or 6,631 Watts per hour per maximum passenger, or 22,631 Btu's per hour per passenger.

c. Bus Btu's: A bus vehicle of 20,000 lbs. and 60 passengers moving at 26 mph while using fuel at the rate of 3 miles per gallon, at 124,885 Btus per gallon, uses 1,082,336 Btu's per hour. That works out to be 18,039 Btus per maximum passenger, but since the bus service is only 26/40 the service speed of the rail systems, that number logically climbs to 27,752. Applying this service to the fuel usage rate, the numbers would be:

HighRoad:	10,146 Btus average per passenger (best)
BRT: (without slow service adjustment)	18,039 Btus average per passenger (second)
Heavy Rail:	22,631 Btus average per passenger (third)
BRT: (adjusted for slow service)	27,752 Btus average per passenger (fourth)

8. Land Use Efficiency: A HighRoad guideway is a pre-cast concrete beam made of pre-cast segments that have interlocking extensions for axial stability and post-tensioning cables that connect them and carry the vertical loads to column heads. The vertical and axial loads are then carried to columns extending from the ground up to a level commensurate with the design

elevation. Since the guideway is elevated, only the columns use land, usually dimensions of 4' x 4', anchored by steel rods into a concrete base of 8' x 8' and at a depth that depends on below-surface pilings design. Typical total land use is 64 sq. ft. per 120 feet of guideway length, allowing the free space between columns for special landscaping as in a parkway, as added lanes for turning or walking paths, or for off-roadway use as an "automobile break-down lane". Where utilities are presently elevated and may conflict with the guideway and HighRoad vehicle they will be relocated beneath the right-of-way, and at the same time improve the visual appearance of the right-of-way.

a. Compared to Other Rail: The efficiency of HighRoad compared to all rail is shown by the factor of column footing usage: 2,816 sq. ft. per mile of guideway, comparable to rail use of an area of 30 sq. ft. per foot, 158,400 sq. ft. per mile, a ratio of 56:1, or HighRoad needing only 1.7% of other types of rail systems' use at grade for 2-track design. Expressed in normal terms, one mile of HighRoad guideway consumes 0.065 acres of land per mile. And heavy rail consumes about 3.6 acres of land per mile for tracks. Therefore, HighRoad's land use efficiency is approximately 56 times greater than the land use efficiency of heavy rail or light rail systems.

b. Compared to BRT: The efficiency of HighRoad compared to BRT dedicated bus lines is similar, with buses requiring 24 feet of roadway width for two- direction travel. Although this land usage is less than MARTA-type rail, HighRoad's land use efficiency is approximately 44 times better than the land use efficiency of BRT systems.

End of Environmental Reviews.

PART D
QUALIFICATIONS OF OWEN TRANSIT GROUP, INC.
AS SPONSOR OF A NEW STARTS PROJECT

The following pages principally contain policies of the Build America Bureau of the Federal Transit Administration of the United States Department of Transportation, and these are presented with shaded text. Comments and notations by Owen Transit Group, Inc. are presented without shading. FTA / DOT Policy statements that support Owen Transit Group, Inc. participation as a Sponsor of the Project are presented as **red** text.

OTG SUBMISSIONS TO SATISFY FTA REQUIREMENTS ARE IN UNSHADED TEXT BELOW.

Owen Transit Group, Inc. is qualified by the below **red** official government statements:

A. QUALIFICATION CRITERIA: FTA BUILD AMERICA PROGRAM – May 14, 2021

" www.transportation.gov/buildamerica/ "

Downloaded Friday, May 14, 2021 from the BAB web page as current policy:

1. Transit

a. The Build America Bureau has worked with many transit agencies and **other project sponsors** to deliver new infrastructure and improve transit services across the country. Whether you're thinking about technical assistance or financing instruments, if you've got a transit project in mind, reach out to us today!

b. Agreed: This was done in late 2020 in accordance with the above instruction. **Bold Red underlined text** above and below indicates projects for which and by whom HighRoad sponsorship is eligible.

2. Eligible Project Sponsors: Eligible Projects:

a.	**State Government**	*	**Intelligent Transportation Systems**
b.	**State Infrastructure Banks**	*	**Intermodal Connectors**
c.	**Private Firms**	*	**Transit Vehicles & Facilities**
d.	**Special Authorities**	*	**Intercity Buses & Facilities**
e.	**Local Governments**	*	**Transit-Oriented Development**

Last updated: Friday, April 3, 2020

B. **About the Build America Bureau**

The Build America Bureau (the "Bureau") is responsible for driving transportation infrastructure development projects in the United States. The Bureau streamlines credit opportunities and grants and provides access to the credit and grant programs with more speed and transparency, while also providing technical assistance and encouraging innovative best practices in project planning, financing, delivery, and monitoring. To achieve this vision, the Bureau draws upon the full resources of U.S. DOT to best utilize the expertise of all the modes within the Department while promoting a culture of innovation and customer service.

The Bureau builds upon the foundation established by the Build America Transportation Investment Center ("BATIC"). The Bureau serves as the single point of contact and coordination for states, municipalities, and project sponsors looking to utilize federal transportation expertise; apply for federal transportation credit programs; and explore ways to access private capital in public private partnerships.

The Bureau combines the Bureau, TIFIA and RRIF loan programs, Private Activity Bonds (PABs), and the INFRA grant program all under one roof within the Office of the Undersecretary for Transportation for Policy.

The Bureau addresses the procedural, permitting and financial barriers to increased infrastructure investment and development by:

- Intervening earlier in project lifecycles,
- Actively helping sponsors navigate and accelerate the often complex federal permitting and procedural requirements,
- Centralizing project coordination and
- Cultivating public private partnerships

The Bureau drives efficiencies and creates further financing optionality for projects in a shorter timeframe helping to accelerate the repair and development of critical US transportation infrastructure.

C. Make the Build America Bureau Your First Stop

The U.S. Department of Transportation is encouraging projects to make the Build America Bureau their first stop when thinking about accessing federal credit programs, or if they are interested in pursuing other innovative finance strategies a public private partnership.

Agreed: This “First Stop” was done by Owen Transit Group, Inc. in late 2020, and OTG was told to contact other FTA organizations in Washington, D.C. which it did in the New Starts section of the FTA. After discussing this with the FTA New Starts section OTG was told that it merited further study by their referral of HighRoad review to the Atlanta Regional FTA Office. This was done and after discussion with Management in the Atlanta Regional FTA Office this document was begun as a first step toward gaining FTA approval.

D. What are the Bureau's policy goals?

The Bureau has developed a strategy that identifies policy goals for taking full advantage of the TIFIA and RRIF programs, which are:

- Enhance the pipeline of eligible projects by providing proactive educational outreach and technical assistance to potential borrowers in utilizing the TIFIA and RRIF programs, and their capacity to fill market gaps by leveraging substantial local and private co-investment.
- Diversify the pipeline of eligible projects by geography (i.e., urban and rural, new States, etc.) size, and type (i.e., **highway, transit, rail, port, etc.), to ensure an equitable distribution of program benefits.**

Agreed: One of HighRoad's major benefits is that whereas 96% of the region's present population does not have reasonable access to heavy capacity rail transit with its high speed, low fares, and dependable service, if it is accepted in the region by government officials then 10 X present actual service (1,000%) will be delivered, using the 19.8% use factor, will have access, a greater percentage of a much greater number of regional residents with heavy rail access. This is particularly true with regard to areas of the region with large populations of minority residents. And net cost to the people affected will be only the still-low fare of $0.35 per mile, while added sales taxes for non-HighRoad transit can be avoided. A second benefit is that the residents who may not use HighRoad also will get benefits from the transference of large numbers of automobile users from already-crowded roadways to transit, lessening the congestion on the already-stressed drivers.

The Bureau is currently drafting an organizational, multi-year Strategic Plan that incorporates these policy goals and features objectives and a timeline for implementation.

E. What are the resources of the Build America Bureau?

There are three core components of the new Bureau:

1. An Outreach and Project Development team, that will continue the Bureau work to **educate project sponsors about how they can best combine DOT credit, funding programs, and innovative project delivery approaches such as public-private partnerships (P3), and then offer project-level technical assistance to get them ready to pursue it. Project sponsors are encouraged to reach out to the Bureau as early as possible in the project development process so the team can work with them on key requirements.**

   a. Agreed: This project sponsor, OTG, Inc. has taken that advice, and this document is the result of that Bureau's work. See **Excel Workbook P. Project** worksheets Sum, Funds, Opns-Cost, Labor and Opns. (or Tables P1–P10) as shown in this multi-year analysis.

2. A Credit Programs team that encompasses the TIFIA, RRIF, and PABs programs. See the following links for more information about each of the credit program components:

- TIFIA (Transportation Infrastructure Finance and Innovation Act)
- RRIF (Railroad Rehabilitation and Improvement Financing)
- PABs (Private Activity Bonds)

a. Agreed: The TIFIA and RRIF bonds are included in Tables P1, P2 and P3 of the above-cited workbook, totaling 29% of the costs of construction for TIFIA and 29% for the RRIF bonds if shared equally.

b. Agreed: Funds from P3 grants by the Sponsor are included in Table 2 of the above workbook, totaling 7.5% of the costs of construction, as a locally-provided participation as well as a needed bridge funding connecting all other financing, since its provision does not add cash flow costs.

3. The INFRA Grant Program team, which will administer the application process for INFRA grants.

a. Agreed: This will be a much-appreciated function provided through the Atlanta Regional Office of the FTA.

b. See Infrastructure For Rebuilding America (INFRA) for more information about this program.

F. Council on Credit and Finance

The Fixing America's Surface Transportation (FAST) Act established a new Council on Credit and Finance, chaired by the Deputy Secretary. The Council is charged with the review of Bureau program applications, making recommendations to the Secretary regarding projects seeking assistance from those programs, and reviewing approved projects on a regular basis. The Council on Credit and Finance builds on the Credit Council that DOT had previously established through administrative measures. The Council on Credit and Finance generally meets on a monthly basis. Agendas from prior meetings of the Council on Credit and Finance are available.

1. **Financing**

2. **The Bureau offers several programs to provide project finance assistance to State, local, and private project** sponsors. These are customizable credit instruments that reduce project costs and increase flexibility. With our credit programs, State and local project sponsors have the ability to accelerate delivery of needed infrastructure projects, often in partnership with private sector investors.

3. Financing Plan Summary: The HighRoad financing plan utilizes "staggered" annual issuance of bonds for one year of funding needs of the project that are calculated by the project sponsor from estimates prepared by the construction team members and approved by the ATL Authority, the state of Georgia agency charged with overall multi-year management of the project.

4. Financing Agreements:

a. Built Sections: HighRoad's planned project delivery will depend on two factors: (1) Governments' approvals of project portions of a sufficient size to create viable sections of revenue service to be built during a year, and

b. Revenue Generation: (2) The ability of the completed portion of the project when in service to create a revenue stream capable of covering costs of operations and retirement of the outstanding bonds. This requires constant financial management of the project to maintain its consistent solvency and the meeting of all project estimated completion schedules.

G. Application information can be found on each of the program pages linked below.

H. **Public-Private Partnerships (P3s)**

1. For many transportation agencies in the U.S. public-private partnerships (P3s) offer an opportunity to tap new financing sources and transfer certain project delivery risks. These partnerships differ from standard procurement practice wherein the public sponsor controls each phase - design, construction, finance, operation and maintenance – of the project's lifecycle. In a P3, a single private entity (which may be a consortium of several companies) assumes responsibility for multiple phases, **accepting long-term risks in return for prospective rewards.**

2. Agreed for Construction: **Excel Workbook P.** Table P2 and Table P3 shows the use of P3 financing in addition to state and federal recycled tax collections that are recycled to the project's construction (instead of grants) and TIFIA and RRIF revenue-backed 35-year bonds. The P3 financing was needed to provide sufficient cash flow for the project, especially in its early phases. The P3 funds provider, Owen Transit Group, Inc. (OTG) is the proposed Sponsor of the project, and is at risk for as much as 50% of its prospective earnings from the project. To offset this large funding package, provided incrementally during the project construction period, OTG engages risks of very large losses from causes beyond reasonable business risks and proposes that it receive all cash flows into construction that are not expended in the construction of the system.

3. Agreed for Operations: Also, since as a P3 financing source OTG realizes that there are risks from operations and potential lack of development of ridership after construction due to unforeseen conditions, it will be at risk of inadequate cash flows from operations. Accordingly, this risk of inadequate revenue from operations to recover some losses from construction funds provided should be offset by 15% of the fares collected, (including fare subsidies if provided) that will be paid to OTG as they are collected from system operation, and that in order for the P3 funds to be provided OTG will also be designated Operator for the system for 50 years.

4. Operations Extra Services: Because OTG /GMG will depend on successful operations for adequate income, OTG will provide staff to continuously review operations and make changes and innovations to assure extensive public use of the system, including continuing analyses of fare rate reductions for increasing operations income and financial stability of the system.

I. **Transportation Infrastructure Finance and Innovation Act (TIFIA)**

1. The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance for **qualified projects of regional and national significance**. Many large-scale, surface transportation projects - **highway, transit, railroad, intermodal freight, and port access** - are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, **and private entities**. The TIFIA credit program is designed to fill market gaps and **leverage substantial private co-investment** by providing supplemental and subordinate capital. The BAB officials clarified this by stating that this credit program must be supported by a government Sponsor of the project being supported. (OST, Dec. 2021).

2. OTG Qualifies: HighRoad should be qualified as a project of regional and national transit and high-speed rail significance and its international significance due to its low cost and high service. It will set a new standard for rail service in America and the world, competing favorably with other more aggressive nations which export old technology transit to gain political and military advantages or for making gain from lesser technologies since they have no competitive technologies. In 2002 OTG as a private company without U.S. Government support encountered this threat in Vietnam when OTG officials met with the Vietnam Ministry of Transport and competed with two nations, China and Japan. These governments offered to give (at no cash cost) to the people of Vietnam heavy rail transit systems in Hanoi and Ho Chi Minh City (Saigon). Both systems, 18 years later, have not been completed and additional construction is now unfunded, yet China has obtained military ocean passage rights and naval ship basing rights in Vietnam that injure the national strength of the United States. HighRoad may help reverse this national loss process with its success assured in the Atlanta region if allowed to proceed. OTG will seek governmental sponsors of the HighRoad in Atlanta Project.

3. P3 Makes HighRoad Possible: Private investment via the P3 arrangements (where the contractor earns income as a result of being at risk for project earnings) for up to 7.5% of the project cost establishes that the Federally-supported borrowing encourages private investment and private purchase of construction bonds, for without the total needed funding there likely will be no private investment, no new jobs and no system. A corollary concept is that without a system of a low-enough cost to be able to financially reward a P3 contractor's participation then contractors are unlikely to participate in a P3-finance transit system.

J. Each dollar of Federal funds can provide up to $15 in TIFIA credit assistance and support up to $50 in transportation infrastructure investment.

1. Federal Support of Financing: Since Federal funds will be involved in the process of project tax collections recycling, and $1 billion of Federal funds could provide as much as $15 billion in TIFIA credit assistance then that can leverage up to $50 billion in transportation infrastructure investment. At this time 58% in bonds guarantees ($11,770,000,000) can be provided for the project at a TIFIA cost of $785,000,000 representing its 1/15 leveraging of Federal credit support is needed to build the $20.4 billion project are required to qualify bonds for sale as its This is adequate for the project's needs which are shown in the workbook **Excel Workbook P. Project,** worksheets Sum, Funds, Opns-Cost, Labor and Opns. **(**or Tables P1–P5) as shown in this multi-year analysis. Based on this possibly being in excess of TIFIA's bond limits, the RRIF loan program may be used for this bonds issuance with both programs

being split evenly at 30.5% each. HighRoad is a rail system and qualifies for RRIF loans or loan guarantees consideration (see below).

2. Federal Funds Recycled: An average maximum of only $21,337,000 issued and then immediately collected (recycled) from the project's taxes each month to repay the issued funds is needed to finance the Federal tax recycling portion of the project. The maximum Federal money estimated to be involved is $21,337,000 and it is fully and finally repaid during the last month of construction, at no cost to the Federal government. An important note is that of all the worker's and their employer's taxes collected, the Federal Payroll Taxes for Social Security and Medicare will not be recycled, but will be immediately processed into their normal Federal Treasury accounts and add funds to those accounts whereas without recycling this may not be collected.

3. State Funds Recycled: Correspondingly, State funds will be involved in the process of project tax collections recycling that mirrors the Federal recycling but using different state personal and business taxes.

K. Railroad Rehabilitation & Improvement Financing (RRIF)

1. HighRoad is Heavy Rail: This is presumed to include HighRoad 85 mph transit, higher-speed commuter rail, intermodal freight container rail at 150 mph and intercity high-speed Silver Bullet passenger rail at 220 mph)

2. Under this program, the Department is authorized to provide **direct loans and loan guarantees** up to $35.0 billion to finance development of railroad infrastructure. Not less than $7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers. Direct loans can fund up to 100% of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government. **Eligible borrowers include** railroads, state and local governments, government-sponsored authorities and **corporations,** joint ventures that include at least one railroad, and limited option freight shippers who intend to construct a new rail connection.

3. Qualification as a Rail Project: Funds from this source are requested since HighRoad design and construction is development of railroad infrastructure, and OTG is a private corporation, allowed by the RROF law as above, and the ATL Authority, a government-sponsored authority, also is an eligible borrower, specifically authorized by HB-930 (2018) for this function. This RRIF participation is reasonable since portions of the HighRoad system will be operating at speeds above transit speeds up to and possibly passing 220 mph, and this system can be considered to include its High-Speed rail passenger and freight services and sharing of transit guideway, stations, maintenance facilities and control system as related parts of the total transit and High-Speed rail service. A freight-carrying system (intermodal international unit containers) is under design using HighRoad's higher-speed commuter rail drive units and the standard HighRoad / Silver Bullet guideway for up to 150-mph automated shipping from ports to (and from) inland cities. This is an opportunity for our nation to improve the speed with which freight essential to the supply-chain needs of many businesses to be met without incurring new infrastructure costs to the Federal Government.

L. **Private Activity Bonds (PABs)**

1. Providing private developers and operators with access to tax-exempt interest rates lowers the cost of capital significantly, enhancing the investment prospects for transportation infrastructure. Increasing the involvement of private investors in highway and freight projects generates new sources of money, ideas, and efficiency. **The law limits the total amount of such bonds to $15 billion and directs the Secretary of Transportation to allocate this amount among qualified facilities. The $15 billion in exempt facility bonds is not subject to the state volume caps.**

2. Bonds Qualification: The HighRoad project would over 16 years allocate $12,202,000,000 to issuance of bonds, divided between TIFIA and RRIF sources, with bonds paid from system earnings (revenues) and not from any government sources.

M. **Infrastructure For Rebuilding America (INFRA) Grants**

1. INFRA Grants: The INFRA program provides dedicated, discretionary funding for projects that address critical issues facing our nation's highways and bridges. INFRA grants will support the Administration's commitment to fixing our nation's crumbling infrastructure by creating opportunities for all levels of government and the private sector to fund infrastructure, using innovative approaches to improve the necessary processes for building significant projects, and increasing accountability for the projects that are built.

Last updated by FTA: Thursday, April 30, 2020 Contact: 1-202-366-2300
(Modified above by OTG Jan. 16, 2021 for questions included and emphasis by underlining)

End of INFRA program information.

N. ADDITIONAL AND MODIFIED FUNDING

Infrastructure Bill HR-3648, Infrastructure and Jobs Act, of Nov. 15, 2021.

Details are attached in the Appendices in an analyst's published article concerning funding, enhancements and restrictions on rail and transit programs in the Law.

The Bill is favorable to HighRoad and its intercity High Speed system Silver Bullet. Details are not provided on this page, but are provided in PART K (page 141) with references to the paragraphs of the Bill that apply to FTA and FRA approvals and funding associated with this HighRoad submittal.

PART E

ADDITIONAL ECONOMIC JUSTIFICATION FOR HIGHROAD FEDERAL APPROVAL

The following pages principally contain anticipated policies of the Federal Transit Administration of the United States Department of Transportation as are found in transportation industry media, and these are presented with shaded text. Comments and notations by Owen Transit Group, Inc. are presented without shading. Policy statements that support Owen Transit Group, Inc. participation as a Sponsor of the Project are presented as underlined text.

A. Return on Investment (ROI):

1. FEDERAL TREASURY ROI

a. Savings from using HighRoad. Cash savings from the use of HighRoad for alleviating traffic congestion in the Atlanta region is estimated, in a manner similar to expected methods for "scores" used by the Federal Congressional Budget Office (CBO) for assessing Federal choices for laws, and is based on avoidance of alternative methods for achieving similar results. See **Table P12-CBO** on page 37 that shows $4,477,574,459 saved by recycling money from project taxes into the project's construction and avoiding grants of $4,488,000,000 by avoiding adding new traffic federal grants for lanes that do not offer HighRoad's efficient financing plan, totaling $8,965,574,459, all new income to the Treasury.

b. Taxes received from rider's savings. By using HighRoad transit instead of driving a modest automobile an annual net savings of $500 per each average daily expected rider would yield Federal taxes on the savings, when spent, a new amount collected of $166,576,640 per year for each year continuous after the riders make the switch, all new income to the Treasury.

c. Employment Taxes. Taxes collected for Federal savings to pay future costs of Social Security and Medicare from all the above total $5,406,125,284 (based on 15.3% of payroll) that will come from the project will be captured by the Treasury under current laws, all new income to the Treasury.

d. HighRoad approval. Approval of HighRoad for an Atlanta transit system of 372 miles is believed to provide net results, adding the above figures, are $14,534,541,728 in new income to the Treasury. The ROI would be infinity since there is no net public taxes cost to the project, and yet a full system would be built. Passengers would only pay a low fare for the service.

2. COMMUNITY ROI:

a. No-Cost Investment ROI: Basis for Return on Investment (ROI) to the community is a calculation in which the gains to the community (having a heavy rail transit system, eliminating as much as 81% of the community's investment in the costs of building and maintaining future roads, and eliminating the annual costs of paying for a regional transit system) compared to the costs of creating the HighRoad regional transit system and

operating it are evaluated. However, since the community investment is Zero dollars due to the funds coming only from government paid-back loans, P3 investments with no public cash input, and with private investors buying construction bonds paid for from routine transit fares equal to or less than current transit fares, the ROI calculation (Value of system $20,000,000,000 / community investment of zero) is infinity. A very good ROI!

b. Another ROI view: The costs of future roads (372.3 miles of transit at an effective equivalent of 3 lanes of roadway per mile) can be extrapolated to a full capacity equal to as much as 10-times those roadway lane numbers), saving a very large sum. Since the calculation reflects the HighRoad plan of self-financing which costs the community nothing, the gain of avoided roadway construction cannot be determined, since the math requires dividing the value of the service by the number 0 is infinity.

(1) Construction Costs: Accepting the HighRoad plan covering all costs of the 372.3-mile HighRoad system's construction cost ($20.0 billion) then a cost of about $14 million a lane mile for multi-lane roads providing equivalent service can be avoided. One HighRoad line can move about 3,280 people, or about 3 lane-miles per mile of HighRoad. HighRoad then would be capable of replacing the initial 1,095 lane-miles of roadway replaced by a beginning HighRoad system, and $15.33 billion of construction costs would be avoided, and the community ROI from selecting HighRoad would be 0.84. As traffic grows over time the ROI would also grow, perhaps as much as to 1.17 in another 20 years, and then to 1.75 in another 20 years, assuming the same rate of growth for the region as presently experienced. Regardless, recognizing that the investment remains zero, then the ROI continues to be infinity, without limit for all future years.

(2) Independent Operating Costs: The above ROI calculations do not even consider the added effects of HighRoad's operating costs being borne from the farebox and not using any of the region's tax receipts for operation and maintenance. All facts support the exceptionally high ROI HighRoad offers to the community.

c. MARTA HighRoad: The added ridership from HighRoad potential connections at the multiple rail ends of MARTA lines will likely provide more riders in their operations. However, since MARTA presently loses money with every rail passenger, MARTA management may decide to change their heavy rail systems over to HighRoad and substantially reduce their multi-decade losses of the past. Their present right-of-way of approximately 30 feet width would allow removal of one of the two sets of tracks during a changeover and install HighRoad columns with guideways while leaving an existing rail line in service, using reverse-run track usage for short distances. Review of their tracks and FTA reports of their annual financial records shows that it is technically and financially feasible. It would turn MARTA into a cash-positive operation instead of a cash-loss operation, of benefit to the local community and the nation, since annual operating subsidy and maintenance grants from the FTA and other Government agencies could be reduced. Again, MARTA could benefit by expanding with an ROI of infinity, as calculated above. At this time, it has not been formally proposed to them by Owen Transit Group, Inc. or by Guideway Mobility Group, Inc.

d. GDOT Managed Lanes: Adding Managed Lanes roadways is compared to HighRoad in **Excel Workbook P. Project** Table P9 – Managed Lanes Passengers Possible. In this analysis HighRoad initially has a cost of $20.4 billion for 1,220,450 riders per day and Managed Lanes has a cost of $26.08 billion if moving the same 1,220,450 riders per day. Based on the above, HighRoad fares best by 27.8% when considering construction costs. And over a 10-x growth of HighRoad's potential riders (at no added construction cost) to over 10 million a day which would have a large cost to be borne by the region for the Managed Lanes construction to serve the same as HighRoad's capacity, and savings to the regional community would be approximately $260 billion, less HighRoad's initial $20.4 billion, or an advantage to the state of $240.6 billion. Again, the State's Managed Lanes roadways programs could benefit by expanding with HighRoad with its ROI of infinity, as calculated above. Although 12 million riders a day seems too large, in substantiation of the premise, the reader should see **Excel Workbook R. Ridership** Table R2 – New York City which reports that in 2019 that city had total rail transit ridership of 5,497,000 per weekday representing 70.5% of the entire city of New York's population at 38% fewer miles of rail but with stations closer together. HighRoad is conclusively a better choice of alternatives because of its potential for very large expansion over coming decades and centuries.

e. Family ROI: ROI for the families of the region is easier to understand. A family has need for transportation to work, school, shopping, medical, etc. However, the marginal costs of transportation to work alone are costs that can be replaced by HighRoad transit trips to and from work, and can be rationally quantified. This would be supplemented by the eventual changeover of MARTA transit from older heavy rail train technology to HighRoad technology.

(1) Trip Savings: Using a to-work trip of 10 miles (and 10 miles to return home) this 20-mile trip would cost an automobile driver approximately $0.55 per mile (Georgia AAA), or $11.00 a day for marginal automobile costs, or $2,750 for one year (250 work-days) of work-related travel provided by an automobile. Since a HighRoad similar trip for work reasons would cost only $0.35 per mile, that annual cost would be $1,750. However, since proposed first-mile/last-mile service by the HighRoad plan would cost an additional $2 per day for the rider's share, the total cost would be closer to $2,250, a final savings of $500 per year. The family ROI for this choice would be $500/$2,750 or 18%. That is a reduction of costs from a HighRoad transit system that has cost the family nothing to build and operate other than continuation of modest fares to provide the daily work trips.

(2) Operating Savings: Since the calculation reflects the HighRoad plan of self-supporting operations which costs the family nothing, the percentage gain of transportation at a much lower cost than before cannot be determined since the math that requires dividing the lower cost of the service by the number 0 is infinity.

f. Gross Community Product: Additional non-transit-using family savings would accrue to the community since more family disposable income (1.25% for a worker earning $40,000 a year compared to automobile marginal usage) would then be available to create more sales of goods and services while fostering a higher living standard in the community. Again, this calculation, not presented here, would be very large since a large

percentage of the non-transit-using community would benefit from the improvement of cash flow and transportation efficiency in the entire region.

B. Extended Technology and National Economics

1. Hybrid Transit and Commuter Service: In addition to the highly-populated cities that would have improved transit service as planned for the Atlanta region, surrounding counties and even distant cities would benefit from HighRoad in Atlanta. A HighRoad vehicle with 150 passengers, combined seated and standing, could be run at faster speeds and cover larger distances between stations more quickly, making it attractive to longer-distance commuters. This would allow HighRoad standard transit rail vehicles to be run into more distant communities for service to those persons who otherwise would be forced to drive, congesting the roadways and making traffic worse. Since these commuters would probably be traveling a distance greater than that of a city transit user, the total trip fares paid would also be greater, substantially offsetting the smaller revenues calculated for only standard city trip lengths, but increasing the savings per rider from a lower cost-per-mile than driving an automobile. Atlanta's present short MARTA rail system has an average trip length of 6.78 miles (FTA statistics for Atlanta), and the HighRoad system with its 372.3 miles of system is expected to have average trip lengths of 10 miles due to its rider reach to desirable destinations and due to expected increased congestion on roadways. A commuter trip length, therefore, could be expected to be a distance of 20 miles or more, providing more funding for continued sustainability of the system and providing more service to the region.

2. Hybrid Transit and Long-distance Intercity Service: Similar to the commuter service described above, a HighRoad transit vehicle with 150 passengers can be simply modified to accommodate 60 seated passengers by move them at speeds up to 220 mph. It could operate on the same service lines as transit vehicles, at the same speeds as transit (85 mph), and when at its departure point accelerate to a commuter speed of over 100 mph and then to its design speed of 220 mph. This flexibility allows it to pick up passengers throughout the region and proceed to its final destination city on shared guideways without needing to drive to distant intercity high-speed rail departure points. Fares on the intercity trips, charged at low city-fares per mile, within a city would be collected and add to the financial sustainability of the entire regional system, while adding to intercity riders and fares.

3. Long Distance Freight Service: At the present time intercity roadways (Interstate Highway System) are used for most truck freight due to the high value or perishability of freight that must move faster than conventional rail. This has been recently observed daily on many crowded Interstate roadways leading into and out of the Atlanta region, and is a primary cause of congestion of those major Atlanta regional arterials. In many cases these truck-congested roads force other personal vehicles to leave the interstates and travel on local county roads, adding to their congestion, and slowing commercial and personal communication. By using HighRoad vehicles' 1,200 horsepower drive units (and exchanging passenger cabins for freight truck trailers or international freight containers) this freight can be caused to travel at twice or more the speed of highway trucks, moving them at a one-ship unloading combined rate of 6 per minute, 360 per hour, or 8,640 or more 20-foot long containers per day in each direction, unloading / loading a 13,000 unit ship in less than two days, increasing the throughput of the nation's ports . This speeding-

up of interstate commerce by shifting road traffic to HighRoad will have a favorable effect on perishable products industries and reduce the need to build more very-expensive interstate-type roads through already-crowded population centers. This is a major national economic advantage not available with any technology other than HighRoad or conventional rail. Unfortunately, conventional rail also is becoming more crowded due to the rising American population and its rising economic standards demands on commerce.

4. Shipping-of-Automobiles Service: Since interstate highways capacities can be exceeded, and drivers' willingness to spend extraordinary time driving to distant destinations, use of HighRoad vehicles drive units (and exchanging passenger cabins for automobile carrier platforms), a new industry modeled after the historical "car trains" service upper-east-coast persons who prefer shipping personal autos to Florida rather than driving them will be a wider-used service that will take even more vehicles off crowded interstates, extending the economic life of those roadways. This is a major national economic advantage not available with any technology other than HighRoad or conventional rail. Unfortunately, conventional rail is becoming more crowded due to the rising American population and its rising use of railroads for freight-only.

5. Stress on Crowded Airspace and Airports: Over the last 100 years Americans have used emerging airplane transportation to overcome the slower speeds of rail and roads networks for longer distance travel. As more people used these services and the population expanded at the same time that affluence increased, the convenience of crowded airplanes and crowded airports, combined with limited abilities of airports to process security-conscious travelers, services offered by intercity HighRoad has increased. Although airplanes for longer distances will likely be preferred when service is available, shorter trips between nearby states and smaller cities may be conveniently served by HighRoad technology. Consequently, use of HighRoad intercity rail is an important part of a national transportation system, and may be needed to minimize added costs for aviation travel.

6. Extension of Interstate Highway Service Life: During the Eisenhower administration (1952 – 1960) the Interstate Highway System was initiated, patterned on the German Autobahn system observed during WWII. Over time as populations grow in America these interstate highways too will become congested (some already have), and the very expensive expansion of the Interstate Highway system may become a national economic concern. By beginning with HighRoad transit and implementing its intercity high-speed rail "Silver Bullet" system the planning and construction for America's transportation networks expansion can begin and be underway when they become a critical national economic need.

7. Conversion of AMTRAK: This rail passenger system operates at a slow speed and incurs increasing losses from operations while disrupting the freight rail service tracks it has commandeered.

   a. AMTRAK Hurts Rail Freight: AMTRAK operates on rails that were built and are maintained by private rail carriers who want to use them for their freight services. Since AMTRAK has controlling authority, it generally wins, and the AMTRAK win hurts the profitability of the private freight rail carriers, and that hurts the nation, unnecessarily. Although they are paid (negotiated) for that use, their freight operations must be scheduled

with AMTRAK services included as priorities. This slow freight speed (assumed to be 50 mph based on the quality and age of the rail bed and track existing) is not adequate to meet the AMTRAK needs of Higher-Speed Rail (150 mph) and High-Speed Rail (220 mph). Yet there is not sufficient funding to upgrade all standard-type rail tracks to the more-banked and smoother railbeds needed.

(1) Standard Rail: Normal daily passenger rail service with frequent stops averaging each 21 miles of travel and obtaining an average speed of 46 mph (from Northeast Corridor schedules) at a comparable heavily-subsidized cost of as low as $0.10 per mile, but also rising to as high as $0.55 a mile for other slow service;

(2) Higher-Speed Rail: Acela daily passenger higher-speed rail service between the same scheduled stops at an average speed of 57 mph (from schedules) is available at a subsidized cost of $0.34 per mile, and

(3) High-Speed Rail: A possible HighRoad *Silver Bullet* high-speed interstate service connecting the same station stops (Washington, D.C. to New York City to Boston) as the basic AMTRAK line at an average calculated speed of 158 mph at a cost of $0.77 per mile and with a very short time of 2 hours and 28 minutes, comparable to commercial scheduled air flight times, and that air flight time does not take into account time for airline arrival and check-in time at airports which must be added to the airline published time. The AMTRAK Northeast Corridor line of 457 miles was used for the calculations. Under this plan a Silver Bullet line ticket would cost $48.51 for an average trip of 63 miles, and no advance booking would be required, with vehicle peak time arrivals as often as each 3 minutes. A full 457- mile trip between Washington and Boston would cost $352.00. HighRoad fares are presented without subsidies, and represent the full cost of the service. A 225-mile trip between Washington and New York City would cost $173.30 on the same basis, and take less than 1-1/2 hours. A non-stop airline fare between the cities was offered recently at $269.00 - - plus taxes and fees. And driving the same 225-miles would cost the wages of a full day of work while racking up automobile costs at $0.55 a mile of $123.75. Therefore, HighRoad is good for AMTRAK and good for the public.

b. Incompatibility of Services: With four levels of usage of the single set of rail tracks that the private freight carrier and AMTRAK use, with four levels of speed, it is obvious that all technologies cannot operate simultaneously unless the services are all operating at the same speeds, the lowest common denominator. This either slows down the services or the tracks must be cleared of incompatible traffic to allow one of the four to be operating without being slowed. This would appear to be a nonsensical management choice if completely true. What it does is prevent use of the tracks for other than management's single choice of service at specified times, preventing the other services using the tracks at different speeds that would serve different types of passenger's budgets and needs. Only by providing individual tracks for these four services would scheduling of tracks be eliminated and efficiency greatly improved. The HighRoad vehicles with its HighRoad / *Silver Bullet* technology can make all the services operate at *Silver Bullet* speed or city speed while on the same tracks, with different zones for different services.

c. HighRoad Guideway Compatibility: Review by OTG shows that a single HighRoad *Silver Bullet* high-speed rail operating at 220 mph on a standard HighRoad transit / AMTRAK guideway could effectively stop at each 21 miles for boarding and deboarding at stations, enabling more localized high-speed service and more accessible high-speed rail for even stops in small-population counties and cities. This combination of services into one high speed service technology allows a simplification of scheduling and a much-improved through-put of all passengers at as much as 3 times the slower speeds of present-day AMTRAK, including Acela service. A complete analysis of this construction and operating plan for this Silver Bullet line is available but is not provided in this submittal to the FTA. the FRA or AMTRAK. When AMTRAK ridership exceeds the design minimum requirement of the *Silver Bullet* system then the costs of tickets can be reduced because most of its operating costs will already have been covered and only marginal operating costs per passenger can naturally be reduced for the benefit of the people.

d. AMTRAK Operations Losses: The financial health of AMTRAK is defined by its year-to-year sustainability. Official reports from AMTRAK for the Northeast Corridor (457 miles from Washington, D.C. to Boston, MA) show losses increasing from year to year which are covered by Federal Government grants as fare subsidies, ranging in grants for 2019 at 9.55% to 2021 at 16.6%. Analysis by OTG shows that at comparable fares for other high speed rail services the HighRoad *Silver Bullet* system would thereby save the United States Government as much as $966,000,000 a year, increasing according to system needs and Congressional support levels.

e. AMTRAK Replacement Process: AMTRAK is encouraged to build an entirely new Silver Bullet system along existing older rail routes having existing rail and roadway rights-of-way at a rate of up to 45 miles a year for 10 years, and paid for over following years from net income from operations, or build a similar line along existing rights-of-way of interstate and national and state highways. AMTRAK could maintain the existing rail access plan in place until segments of Silver Bullet guideways are in place allowing progressive development from ends and from the middle of the route, placing segments into earning situations as soon as possible so that their construction bonds may be retired as quickly as possible for the benefit of the American people.

f. National Economic Advantage: Silver Bullet technology is superior to existing German, French, Dutch, Italian and Chinese CCP government HSR that is not as efficient and cost-effective as Silver Bullet, which allows the U.S.A. to have a technology that outpaces the world's competition since it affordable by all states and nations – but not available to China. The nations listed above, except China, have many miles of standard Japanese or German technology or maglev technology that depend on massive government subsidies needed to overcome operating losses due to system inefficiency. The Chinese system is funded by the CCP government treasury in order to gain international prestige. HighRoad can be used economically and technically for longer trips provided that it is not in conflict with competing (Federally-subsidized) high-speed rail systems that would divide the pool of likely customers and reduce the financial health of this public-P3 system. Although it might not be suitable for coast-to-coast flight replacements, it would do well in 2-1/2 hour trips up to 400 miles during which riders might be able to work or relax and not be concerned with weather delays frequently forced on airline passengers.

PART F
ADDITIONAL PROGRAMS FOR WHICH HIGHROAD MIGHT BE ELEGIBLE

The following pages principally contain other programs of the Federal Transit Administration of the United States Department of Transportation in which HighRoad might be supported. FTA document text is shaded. Comments and notations by Owen Transit Group, Inc. are presented without shading.

A. Core Capacity: (Substantial corridor-based investment in existing fixed guideway system):

1. Increased Core Capacity: The HighRoad ATL System will result in increased core capacity of the connected existing transit systems, although this is not a principal supporting justification of the HighRoad system. Accordingly see the justification for HighRoad as a New Starts project and its effects on the regional transportation system in the Atlanta region

2. Adding to Core Capacity: Adding to any core capacity by extension of any existing system is not the primary purpose of the HighRoad rapid transit system. However, as a regional transit system primary service, some existing MARTA bus lines, rail lines or rail lines' right-of-way will not receive any investment from this project, although those services may be used to extend the HighRoad lines. Although this may be a benefit of HighRoad to MARTA's riders or to any existing bus system, it is not the primary reason for building and operating a HighRoad system.

3. Atlanta's Core Capacity: In the Atlanta region the core capacity of transit is provided by buses and MARTA rail which operate at financial losses to the counties and the State of Georgia. Since the MARTA bus service capacity is very slow, inefficient and exceptionally expensive to operate, it is essentially the wrong technology for this need, but its buses may be repurposed as short-line lateral connectors and to provide access to primary radial high-capacity heavy rail HighRoad lines. The HighRoad corridor-based investment in new fixed guideway transit is $20.0 billion in 2021.

4. Core Capacity Increases: If increased Core Capacity of rail in the region is a target of Federal Government policy, then increasing rail transit from MARTA's present 47.6 miles of service in the region to HighRoad's proposed 372.3 miles of service would be an increase of Core Capacity by 691%. However, adding to existing core capacity is not the purpose of this project.

5. Core Capacity Policy: If increased Core Capacity relating to bus service is a target of Federal Government policy, then the operating costs per passenger for a bus passenger for a slow service and comparing those costs with those of a HighRoad system shows that HighRoad's average speed is about 40 mph and a county bus average speed is about 26 mph, a difference of 53%, a HighRoad potential increase of Core Capacity. By cutting these costs by repurposing buses for shorter connector lines the local bus operators will lose much less money each year, improving the sustainability of existing bus services. Replacing low-capacity radial bus or outmoded rail lines with high-capacity modern HighRoad lines will provide substantial additional operating net income each year while making the HighRoad system more useful to

the population. The differences are large amounts of money saved/earned by each of the county operations.

B. Extension to existing system:

1. Purpose: Extension of any existing system is not the primary purpose of the HighRoad rapid transit system. As a regional transit system primary service, some existing MARTA rail lines may be used to extend the HighRoad lines, but that will be a decision made by MARTA officials, and are not costs included in this proposal. Although this may be a benefit provided by providing HighRoad to MARTA's riders or to any existing county, regional government or state authority bus system, it is not the primary reason for building and operating a HighRoad system which is to provide additional transit services to the unserved people of the region.

C. Program of Interrelated Projects -

1. Program of Interrelated Projects:

a. Definition: Using the definition that a Program of Interrelated Projects is the simultaneous development of two or more new fixed guideway capital projects or core capacity improvement projects, the HighRoad system will be partially described by this definition, since it will be in addition to the existing MARTA rail and bus system. This may be applicable since initial HighRoad projects may be multi-county projects that cross county lines and local jurisdictions, as authorized and encouraged by the Georgia law HB-930 relating to the ATL Authority that governs cross-region interrelated county projects. All non-MARTA transit projects will be supervised by a single authority, the Georgia ATL Authority.

D. FAST Evaluation and Rating Criteria

1. New Starts:

a. Project Justification:

(1) Mobility: HighRoad is justified by the 372.3 miles of routes in the 5,872 square-mile region that will be provided, with all routes interconnected, when supported by local bus services and HighRoad's first-mile / last-mile service availability and financial support. HighRoad routes will be based on principal destinations and right-of-way availability identified by county planners and on similar destinations identified by the ATL Authority as the final route decision selection officials and will offer one-seat rides of up to 30 miles along 3 principal corridors crossing the Atlanta region.

(2) Environmental Benefits: HighRoad is justified by its conservation of the environment while provide the best of all transit options. Even as it exists into the future its growth will not harm the environment through which it runs. See the extensive environmental advantages and observations presented above.

(3) Congestion Relief: HighRoad is justified by its ability to draw passengers from congested roadways by virtue of its lower costs, greater convenience and lifestyle improvements resulting from its use. In addition, HighRoad can expand capacity by a factor of 10 at no extra cost, covering costs from fares. See Table 14 AASHTO on congestion calculations and other advantages accruing to the public throughout this document.

(4) Economic Development: HighRoad is justified by the positive economic advantages provided by the adoption of HighRoad as the principal rail transit technology of the region as well as it superior service to the community, promoting better lifestyles for the people. See section H. Community and Family Economics and following under Ridership above.

(5) Land Use: HighRoad is justified by its small consumption of disturbed land and the flexibility of the land between columns that can be used for beneficial purposes. No other technology is as efficient in land use and conservation of the environment. See **Section 5. The Plausibility of the forecasts for the proposed projects** above in **"Sustainability".**

(6) Cost Effectiveness: HighRoad is justified by its lowest cost per trip for riders and for the governmental unit that sponsors the project that can avoid large subsidies required to serve only a relatively few riders. See **Excel Workbook, R. Ridership** Table 7 – Comparison of Modes.

a. Local financial commitment:

(1) Acceptable degree of local financial commitment including evidence of stable and dependable financing sources

(2) State Bonds: A guarantee from the State using HighRoad transit systems as collateral for State-backed bonds and as Revenue collateral for Federal bonds issued by the FTA, RRIF, FHWA, PAB is already included in Article 2 of Georgia Law HB-930 (2018).

(3) State Loans: A guarantee from the State that the ATL Authority may make short-term loans to the project which are anticipated as meeting the intent of the Recycling of Taxes for state-participation in financing the project is included in Article 2 of Georgia Law HB-930 (2018) paragraph B. 2. on page 114 of this document is provided below. Additional legislative clarification of this process may be needed.

(4) Other State Bonds: The ATL Law, HB-930. Allows use of State of Georgia bonds issued by the ATL Authority for construction, up to its $1.0 billion statutory limit.

(5) Business Plan Sustainability: The Business Plan is evidence that it is a reasonable basis for consistent long term income projections, based on the analyses illustrated in Excel Workbook P. Project - Tables P1 through P5, and in Excel Workbook R. Ridership – Tables R1 through R9, and accordingly is believed to be reasonably

accepted by the ATL Authority and will be included in participating county Regional Transportation Plan updates to the ARC's inclusion in their Concept 3 documents.

(6) P3 Participation (Local): A letter from the OTG, Inc. Board of Directors agreeing to PPP financing up to 7.5% of project final approved cost are shown on page 26. This is a local corporation, Georgia-based, and illustrates both corporate and personal local financial support.

(7) Sales Tax approval not needed: The HighRoad Construction and Operating Plans do not require any local county funding and this has not been requested.

PART G
Private and Political Organizations which may provide transit services under Georgia Law:

A. **ATL Law Excerpts:** The following are excerpts from the ATL Authority law, enacted as HB-930, 2018. Under Article 2 it authorizes the ATL Authority to provide a transit system for the entire ARC Atlanta region, as follows (key lines are underlined):

"(3) To plan, design, acquire, construct, add to, extend, improve, equip, operate, and maintain or cause to be operated and maintained transit systems and transit projects, and all facilities and appurtenances necessary or beneficial thereto, within the geographic area over which the authority has jurisdiction or which are included within a regional transit plan or transportation improvement program and provide transit services within the geographic jurisdiction of the authority, and to contract with any state, regional, or local government, authority, or department, or with any private person, firm, or corporation, for those purposes, and to enter into contracts and agreements with the Georgia Department of Transportation, county and local governments, and transit system operators for those purposes;"

"(4) To plan, design, acquire, construct, add to, extend, improve, equip, operate, and maintain or cause to be operated and maintained air quality control installations, and all facilities and appurtenances necessary or beneficial thereto, within the geographic area over which the authority has jurisdiction for such purposes pursuant to this chapter, and to contract with any state, regional, or local government, authority, or department, or with any private person, firm, or corporation, for those purposes; provided, however, that where such air quality control measures are included in an applicable implementation plan, they shall be approved by the Environmental Protection Division of the state Department of Natural Resources and by the United States Environmental Protection Agency where necessary to preserve their protected status during any conformity lapse;"

(Note that the above paragraph specifically calls attention to the principal purpose of the Law is to create the means for building a regional transit system such as HighRoad, and the implication is that a regional transit system is to be built using the law, otherwise the law is rendered useless if it allows the inaction of an agency assigned to carry out the activity. The ATL Authority is to take charge and build the system using the law.)

And continuing from the HB-930 Law:

"(5) To make and execute contracts, lease agreements, and all other instruments necessary or convenient to exercise the powers of the authority or to further the public purpose for which the authority is created, such contracts, leases, or instruments to include contracts for acquisition, construction, operation, management, or maintenance of projects and facilities owned by local government, the authority, or by the state or any political subdivision, department, agency, or authority thereof, and to include contracts relating to the execution of the powers of the authority and the disposal of the property of the authority from time to time; and any and all local governments, departments, institutions, authorities, or agencies of the state are authorized to enter into contracts, leases, agreements, or other instruments with the authority upon such terms and to transfer real and personal property to the authority for such consideration and for such purposes as they deem advisable;"

B. The following are additional excerpts from the ATL Authority law, enacted as HB-930, 2018.

1. Page 29: ATL Authority (11) "may issue revenue bonds". State Limitation: $1 billion total, not likely to be used since the system financing plan does not use any State of Georgia revenue bonds, however it remains a possibility for use in the event that Federal bonds are not used to the extents needed.

2. Page 30: ATL Authority (22) "may extend credit" and "may make loans": Monthly recycled short-term construction loans may be provided by the ATL, therefore State participation for recycled loans is already approved in statute (HB930- 2018). However, no provision in the HB-930 Law specifically states that such taxes collected (as estimated) are to be returned immediately to the project, and legislation may be needed.

3. Page 32: ATL Authority (31) "may receive federal grants, loans & other moneys"

4. Page 35: ATL Authority (6) (a) (1) "may issue revenue bonds. Not needed with Federally-issued TIFIA & RRIF bonds. Note that the RRIF bonds are based on rail systems and this Federal bond funding does not exclude the HighRoad systems of transit and intercity passenger and freight rail services. The HighRoad transit plan includes capability for commuter rail service and high-speed passenger rail service which will be supplied at the same time transit services are extended throughout the less-dense population sections of the Atlanta region.

5. Other observations from the ATL Law - Counties are to:

a. Submit Comprehensive Transportation Plan project requests to the ARC to be included in the ARC Concept 3 Plan, a long- range plan including expansion of bus and rail services in the Atlanta Region. This is required when ATL sales taxes or county funds are to be used for transit improvements. It is not required for non-county entities (allowed by Federal Law) which are system sponsors and such taxes are not needed.

b. Submit Comprehensive Transportation Plan project requests for specific technology to be used to the ATL Authority. This is required when ATL sales taxes or county funds are to be used for transit improvements. It is not required for non-county entities (allowed by Federal Law) which are system sponsors and such taxes are not needed.

c. Submit requests to the ATL Authority for areas to be served and routes used. This is required when ATL sales taxes or county funds are to be used for transit improvements. It is not required for non-county entities (allowed by Federal Law) which are system sponsors and such taxes are not needed.

d. Submit requests to the ATL Authority for specific technology and specific operators to be used. This is required when ATL sales taxes or county funds are to be used for transit improvements. It is not required for non-county entities (allowed by Federal Law) which are system sponsors and such taxes are not needed.

PART H
Funding Recommendations & Process

A. FTA's decision to recommend a project for funding is driven by a number of factors, including:

1. Factors:

a. the "readiness" of the project for capital funding:

(1) Please see worksheets listed below in Excel Workbook P. to review how the cash flow works sustainably, including tax recycling. The engineering design, construction and operations teams are assembled. The Cash flow plan also is completed and illustrated in **Excel Workbook P. Project** (Sum, Funds, Cash-Opns., Oper., Labor) Tables P1 – P5. The Specifications that describe the design, construction and operation of the system are completed. The Cost Estimate also is detailed and substantiated through 2021 in **Excel Workbook P.**

(2) Please see **Excel Workbook D.** for specification documents describing engineering design that illustrate the completion of design ready at this time to be put into final contract drawings and manufacturing instructions. The project will proceed when funding for these drawings for construction are completed. These specifications are ready for construction Drawings and Construction.

(3) The engineering, construction, management and operations teams are already assembled and are ready for beginning the extensive preparation for advancing the project.

b. the project's overall rating:

(1) It is believed that this rating should be very high, based on HighRoad's efficiency and affordability while meeting FTA and ATL Authority requirements, while considering the skills and qualifications of the Construction and Management Teams, and also while considering higher costs of other competing older technology systems still available as they mature and need frequent grant funding by governments for repairs and replacements. HighRoad is likely to exceed the ratings assigned to all other projects based on its lower construction costs and operations costs and its higher service to the public, all derived from its 21st century new technology innovations.

c. geographic fairness:

(1) Different parts of the Atlanta region suffer from insufficient roads, roads quality, bus services, and general transportation opportunities, some more than others if they are not already provided in the MARTA heavy rail service area of Fulton and DeKalb counties. Residents in lower income sections of the region also may have lower ability to purchase, operate and maintain automobiles while, unfortunately, having greater distances to travel to available jobs and to affordable housing.

(2) In underserved, as well as in "well-served" sections, the multi-lane roadways in Atlanta's counties are crowded from local as well as pass-through counties as defined in the AASHTO (American Association of State Highway Transportation Officials) standards for roadway design and capacities. This congestion delays traffic cumulatively, such that a one-minute traffic light delay per mile on a 10-mile roadway section will delay traffic for 10 minutes on that roadway distance, plus time associated with deceleration and acceleration at each crossing intersection, adding as much as 2 minutes more to the total of lost time. See **Excel Workbook P. Project** - Table P6-Congestion for this AASHTO-based calculation.

(3) This is the same for all counties in the Atlanta urban region. Imbalance may result from some sections having only 2-lane roads while other sections have more 4-lane roads. Since this overflow of capacity may force some drivers to use Interstate Highways as alternates, the result is that the Interstates may in turn become congested, adding to delays in travel for all. This is evident in Atlanta to any person caught in traffic on Interstates 20, 75 and 85, as well as the perimeter highway I-285. With future toll-lanes bypasses on the Interstates a higher-income driver may not be slowed by high traffic, but this costs the driver an extra toll and selectively harms those drivers with low incomes or lack of skills (elderly) who alternatively choose to avoid Interstates. Although the managed lanes are intended to speed up traffic for all, then the managed lanes would fairly be open to all. They are not. Tolls must be paid by all who use them.

d. the amount of available funds versus the number and size of the projects in the pipeline:

(1) No funds are known to be available now for heavy rail or light rail, BRT, or other technology improvements in the pipeline available for all people equally in the Atlanta region. The OTG estimate of transportation needs is approximately 20.4 billion dollars (2021) for the 372.3-mile system during the next 16 years. By using this HighRoad financing plan (Excel Workbook P. Project) those services can be provided in a no-net-cost manner, creating tens of thousands of new jobs, increasing state, city and national governments' incomes, and improving the net efficiency and convenience of the traffic/transit system, while not increasing taxes on the population.

B. Receipt of Construction Funding

1. FTA requirements:

a. To receive a construction grant agreement a project must:

(1) Complete Planning, Project Development, and Environmental Review Processes

(2) Meet Project Readiness Requirements (technical capacity, firm and final cost estimate, all funding committed)

(a) P3 funding of 7.5% of the total cost of construction is committed as evidenced by letters from the Boards of Directors of Owen Transit Group, Inc. and Guideway Mobility Group, Inc.

(b) Local short-term Georgia ATL Authority construction loans called "Tax Recycling" is allowed under Georgia Law HB-930 (2018) (See page 113 of this submittal, paragraph B. 2) subject to the decision of the Atlanta Transit-Link Authority Board which is charged with all Atlanta Region (defined by the Atlanta Regional Commission, the MPO for the Atlanta Region) transit construction approval and oversight. Approval by the ATL Authority Board will also include this loan provision. The law does not specify the mode for repayment of these loans, but Georgia Legislature approval of the tax income from the project is likely, and will be introduced as legislation in the next Legislative session. This amounts to 10.99% of the total funds needed.

(c) Federal short-term construction loans called "Tax Recycling" is not allowed under Georgia Law at this time. Rather than request funds from the Federal Treasury through the FTA, a House of Representatives' bill will be introduced in the next session of Congress as appropriate to the House's management of Federal funds appropriations and cash flow needs of projects. This amounts to 20.42 % of the total funds needed.

(d) The balance of funding will be sought from the FTA not as grants but as long-term revenue-bonds of up to 35 years issued annually (staggered) by relevant transportation agencies, with coordination by the FTA: TIFIA (transit system capital), RRIF (commuter railroads), FHWA (highway-based right-of-way for transit and commuter rail as well as for reduction of immediate need for highway construction expansion), Private Activity Bonds and FAA Airport Development agencies (airport-related transit construction with transit operations that pay for related revenue bonds), with delays of beginning annual repayments up to 5 years for each bond. This amounts to 61.09% of the total funds needed.

(e) Should the funds from items (1) through (4) above not be available, then funds will be sought from (a) Federal D.O.T. grants, or (2) County or other district taxes approved for the purpose by the voters in that county or district.

(f) Failing to accumulate the funding guarantees for the project, the Atlanta Regional HighRoad project will be suspended, and the project will not advance. Accordingly, the use of HighRoad vehicles and guideways will not be available for verification of the technology as suitable for transit, for commuter rail, or for affordable intercity high-speed rail, for intercity higher-speed freight rail and those projects already in development also will not advance.

b. Receive a "medium" or higher overall rating

(1) HighRoad's High Rating. A careful reading of the data herein presented in favor of HighRoad as the technology used for implementing a 372.3-mile heavy capacity rail transit system for Atlanta region is believed by the writers of this submittal to be proper, correct, and adequate for official approval. Supplemental professional responses to this data are available upon request.

c. Meet all other federal requirements

(1) Federal Requirements Met. The above requirements will be met by the submittal of this document to the FTA and the FTA's further review of its contents, any approved changes needed to meet FTA regulations, and additional submittals required by the FTA.

PART I
OTG COMMENTS

Owen Transit Group, Inc. Comments Regarding this HighRoad transit System Proposal.

A. **Effects of HighRoad:** Effects of authorizing and building a HighRoad transit system:

1. HighRoad multiplies the miles of and ridership of heavy-capacity rail substantially above that which is presently available in the Atlanta region as is needed to provide adequate rail transportation to residents of the region as provided in law by the Legislature of the State of Georgia and to avoid unnecessary costs to be paid by the residents of the region.

2. Assures that needed transit is made available without addition of taxes on the population, allowing needs of other transportation projects that may require large increases in taxes that may be met.

3. Adds approximately 30,000 new high-paying engineering, construction and community supported jobs to the region for each of the sixteen years needed to provide the 372.3-mile transit system.

4. Assures that development of high-speed rail Silver Bullet OTG technology and its related HighRail high-speed freight movement from ports with their ship-waiting congestion can continue.

B. **Effects of No HighRoad:** Effects of not authorizing and building a HighRoad transit system:

1. Assures the people of the region that heavy-capacity rail will not be built over the next two decades (at least) due to the absence of a rational economic plan for finance and maintenance that would be supplied by the leading HighRoad team corporations, Owen Transit Group, Inc. and Guideway Mobility Group, Inc. The technology is proprietary and its use will depend on continued operations of Owen Transit Group, Inc.

2. Assures that development of high-speed rail and its related high-speed freight movement from ports with their ship-waiting congestion will not continue, and ports will be more likely to remain congested while costs of freight carriage inland will increase correspondingly.

3. Assures that even with large supplies of money from new transportation taxes only limited-service tracks of heavy-capacity rail can be built, and that even with those expenditures as capital improvements, there will be a very large annual tax subsidy needed to be added to all taxpayers' burdens to cover losses from operation of the limited system.

4. Assures the community that the 30,000 HighRoad-supported jobs will not develop, and that the community, national and pass-through family benefits will not develop.

COMMENTS ON HIGHROAD'S & SILVER BULLET'S SPECIAL DESIGN and WHY THEY ARE BETTER PUBLIC TRANSPORTATION MODES THAN ALL ALTERNATIVES

What are they?

The HighRoad rapid transit system and the Silver Bullet High-Speed intercity rail system give you high-capacity systems of special design, having been awarded two patents for technical achievement by the United States Government, but not yet having been built as operating systems. Almost all components are commercial American manufactured products in current use in elevators, paper and carpet mills, aircraft and industrial controls. The vehicle bodies are to be made similar to high quality American 21st century commercial aircraft fuselages (but without wings and tail) and without the excessive weight that conventional trains need for protection from possible crashes at ground level.

Are They Railroad, Monorail or any other Old Technology?

None of the above. Some say monorail since from a distance they look like monorails. But they are not.

Some say railroad, since they have steel wheels and roll on flat steel plates, and the wheels look kind of like train wheels. But they are not. And they obviously are not buses, trains or streetcars. Actually, the U. S. Patent Office said the HighRoad's features were so new they had to give it a new name, "Dual-Sided Monorail", and credit the system with over 30 patentable features that neither rail nor monorail have. That's why we say - - -

"It looks like a monorail, and has more capacity than a train, but it costs less than BRT. It's HighRoad!"

Most of these HighRoad and Silver Bullet features are in the following paragraphs, and all illustrate why HighRoad and Silver Bullet are unique – and result in transit and intercity high-speed rail systems that cost less, provide more service, and are much safer than any other type of transportation system.

HighRoad's & Silver Bullet's Special Patented Guideway

The guideway is a patented pre-cast segmented steel-reinforced elevated concrete beam supported on widely-spaced columns allowing surface travel beneath the transit system. The design cross-section allows vehicles to be supported on both sides simultaneously, with two-directions of travel on only one beam. The overhanging design cuts costs and provides all-weather

protection for the motors and power system, with automatic snow and ice removal. The wide top surface provides easy access to vehicles stopped anywhere on the guideway.

Its heavy and sturdy construction will provide stability even in hurricanes Because the guideway is overhead, it uses little land and highway rights-of-way, keeping right-of-way costs low. And the Patent Office considered this joint-use technology with its 30 patentable features to be novel and worthy of Government approval. Nothing since then has changed, except that additional features have been added to enhance the HighRoad and Silver Bullet values to the public. And for combined HighRoad and Silver Bullet systems, only the cabin seating and number of automatic doors are different. Both vehicles' designs use mutually- interchangeable parts, such as motors, wheels, controls, windows, doors, air springs and tilting systems.

How Are HighRoad and Silver Bullet Related?

The same company that created the 85-mph HighRoad Rapid Transit System technology with 150-passenger cabins also created the Silver Bullet high-speed 220-mph version with 60 seats and a lavatory that is designed to operate on the same guideway. Because of its appearance, speed, and compatibility with HighRoad's developed system, Silver Bullet can compete with airline service on many routes, reducing congested air travel spaces and utilizing the elevated space above existing highways while also speeding interstate highway travel and unclogging the lanes.

The differences are that the Silver Bullet carries only 60 seated passengers in airline type seats at the same pitch of 36" as the transit vehicle, and has only 2 large doors instead of 4 doors. It uses the same motors and controls as the HighRoad, and it has a similar tilting cabin and to get higher speeds only needs to operate the computer-controlled motors at a higher rpm. The Silver Bullet will be used primarily for connecting counties within a state and for connecting principal cities of the United States. One proposal on the table now is a Silver Bullet connection between Atlanta and Charlotte, while at the same time connecting counties along the way in Georgia, South Carolina and North Carolina. That line in the future could be extended to Washington, D.C., New York City, and Boston, MA, or other locations around the nation, even to Texas or California. And it first might be used to replace the Amtrak N.E. Corridor line between D.C., NYC and Boston with a faster and lower-cost service. Its average speed would be approximately 158 miles per hour, including stops along the way.

And there is a Hybrid, faster HighRoad option. By adjusting the number of passengers of a HighRoad vehicle downward, and limiting the need for acceleration rates and gradient energy, a balance point can be found in which a HighRoad vehicle, with some passengers standing, can go faster on some routes and greatly increase average trip speeds. This would be most likely used as a commuter vehicle, and offers a balance between the two uses originally planned for the technologies. We can call it "HighRoad-Plus".

A scale model of a HighRoad vehicle on one side of a guideway.

Faster and Shorter Transit Trip Times

Transit riders are in need of low-cost time-saving methods of getting to business appointments, housing, work, shopping, schools, entertainment and medical facilities. Whereas buses and automobiles run on roads in conventional slow traffic, HighRoad is above traffic and congestion, and can achieve higher average speeds possible only with such grade separation. This makes HighRoad's operating costs much lower and allows it to be faster, safer, and more comfortable. The faster and shorter trip times cost the systems' operating departments less, and this savings is passed on to the people as lower fares. This helps reduce the need for operating subsidies, both state and Federal. And it makes possible moving from one side of a large city to work, housing, education or medical service opportunities on the other side of a county or even beyond neighboring counties in an hour or less - - - sometimes much less. A special benefit for linked cross-region riders is that in many cases they can have long trips of one-seat rides (not transferring to another HighRoad line) instead of transferring to a multitude of local bus trips – which take a long time. HighRoad can move people much faster.

Quiet

Special attention has been made to protect your ears from normal rail system noises, with HighRoad track rails designed to be flat and smooth, avoiding maintenance costs of old-technology rail systems with their repeated rail grinding. Instead, rails are flat and smooth to match HighRoad's flat wheel surfaces that allow noiseless rolling. In addition, the tightly anchored solid steel rails prevent rail sounds from typical railroad vibration resonating sounds to be quieted by mass-damping from their solid attachment to the heavy guideway concrete or the "screeching" of wheel flanges on curved rails. HighRoad has no flanges on its wheels since its design is much safer with its 3-wheel stability design. We call this system of smooth rails and wheels "Quiet Rail".

Wheels and rails are engineered and installed to be co-planar and reduce stresses and noise generation by both. Motors are not old-style noisy types with reduction gears, but new modern high-torque VFD types with non-geared variable speed synchronous wave electronic control, keeping sound tightly contained within the motor casings while enclosing motors within guideway overhangs. Compared to the roar of rubber-tired automobiles and buses on the freeway, HighRoad and Silver Bullet offer blessed quiet, another reason for choosing these technologies.

Comfortable While Meeting ADA Requirements

Although the HighRoad trips will be fast and short, you still need to be comfortable. The vehicles are designed with fully-tilting cabins for management of centrifugal forces on curves, allowing higher speeds. The wider seats will be cushioned, offering more independent personal space for security and body and leg positioning. Also, seats will have large 36-inch row seat spacing, with 32-inch-wide aisles and 48-inch-wide doors for easier entry and exit movement. For those passengers needing them, HighRoad will offer spaces for wheelchairs with static wheel restraints on the floor at each of its four doors while the Silver Bullet vehicle will have spaces for wheelchairs with similar static restraints, adjacent to its two doors.

Regarding Adjacent Small Counties

The Federal Government policy suggests that if you live or work in an adjacent smaller-population county then in order to be fair to those residents that county needs to be a part of any regional transit systems that run primarily in larger and more densely populated counties, regions or states. This is part of the HighRoad and Silver Bullet plans for finance, ridership and routing. The plan provides for HighRoad and Silver Bullet lines to be in place to connect high density population counties to counties with low population densities while providing with more origins and destinations for all riders. It also is to connect riders with the job and housing opportunities in all parts of the region and to fairly serve all the connected counties. Its added riders from less-dense adjacent counties can increase total system operating revenues of all counties, and these added revenues can be used to cover the added costs of serving all those regional taxpayers fairly. See the section on Commuter rail which also comes under this planning and design policy.

Environmentally Green

"Green" is a relatively new term that generally describes something that is not harmful to the environment and is helpful to human life. HighRoad and Silver Bullet are "green" technologies and are not harmful in any way. They are clean, electricity-powered systems (electricity produced by wind farms, solar collector expanses, hydro-generation, nuclear heated generators, natural gas-powered generators, and even clean-coal-powered generators that may still be remaining) when the system is running. These lower-polluting systems allow reduction of pollution from the alternative of even more roadway vehicles, airborne particles, harmful gases or unpleasant noise, affecting everyone's quality of life.

In contrast, alternative transportation technology fuels of compressed natural gas, diesel and gasoline liquids still used by traditional older buses, trains and automobiles can pollute the public's air with volatile fuel vapors, liquid fuel leakage, high-carbon gas production and tire and fuel exhaust particle pollutants that are released into the local community. HighRoad reduces this old technology effect that will be made even worse by expected increased regional population growth that will cause more ground congestion and expanded bus, automobile and heavy rail vehicle noises. And part of HighRoad's "green" design includes capturing energy for reuse by using regenerative-drive brakes, returning power back to the electrical grid and reducing costs.

Higher Capacity

HighRoad vehicles provide you with your transit as single cabin units of 150 passengers each moving at a planned top speed of 85 mph (but faster is possible), keeping times between stations very short and moving more of the public more efficiently than the alternatives. The Silver Bullet vehicles operate as 60-passenger cabins with a planned top speed of 220 mph (but faster is possible). For longer Silver Bullet intercity trips an attendant can be added as will be an on-board lavatory or even a galley for coffee and snack service.

In addition, both system's vehicles are spaced to run frequently at short time intervals to make station waiting times minimum, to make travel opportunities more frequent, and to eliminate wasted time between departures and arrivals. This allows the public to ride the systems rapidly with minimum delays and minimum crowding. In fact, the capacity of a HighRoad or Silver Bullet system exceeds that of a conventional older-type subway train and "managed lanes" roadways and old standard trains while improving service for the public with more access and more frequency as well as at higher speeds.

Expandable

When a rail system cannot properly serve the public's needs because it has too few miles of track or too few vehicles to meet the numbers of people who need transit or intercity transportation, it usually must add more miles of expensive track and add more expensive vehicles to its already-

slower trains. And this sometimes makes the system managers ask for even more taxes to cover their increased passenger demand that typically results in even larger operating losses.

The longer trains mean that the older systems also need longer and more costly stations, and even more acres of land in residential areas. And since trains need longer times to accelerate or decelerate due to power/weight and brake limitations this can become difficult and expensive. However, HighRoad and Silver Bullet merely add vehicles that shorten headways (time separating vehicle arrivals) and continue as before, with the ability to multiply initial capacity by as much as 10 times or more with all costs covered by the normal fares. And its low construction costs simplify adding more routes or lengthening existing ones since everything else will already be in place for this expansion.

Lower Costs to Build

HighRoad provides more transit and intercity rail for much less money. Their joint-design guideway is made of precast concrete, formed off-site in industrial zones, assembled and installed at the roadway, and finished at a very high rate per crew, adding as much as 320 feet of guideway (or more) each day for each crew, or about 15 miles per year for each 2-shift team working 5 days a week. Using several crew teams can make the system buildable in several locations at one time. Stations are smaller than older technology designs, replicated from a standard plan, also with components precast in quantity in factory-like yards, and rapidly assembled by builders who finish the interiors and add subcontracted systems for elevators, escalators, generators, lights, power, plumbing and HVAC. This simple, modern way of rapidly building a system cuts costs dramatically and gets the job done in all regions more equitably. Smaller stations are used since single vehicles do not need long, expensive stations, allowing communities to have smaller stations that cost just a small fraction of what older type subway/heavy rail stations cost, while moving the public in greater speed and more comfort.

Efficient VFD Motors

Four Georgia-built (in Gainesville, Hall County, by ABB) Variable Frequency Drive (VFD) HighRoad high-torque motors of 300-hp each are installed in each vehicle to provide for redundancy of drive power in the event one or more motors become inoperative and to provide fast trips. The VFD power management controllers modify incoming alternating current (AC) electric power to maximize horsepower and torque for climbing hills, and for accelerating and controlling speed by modifying the power cycle frequency to control motor RPM (Revolutions Per Minute). These VFD controllers are built in Gwinnett County. The motors are linked for synchronous operation and have minimum electrical power losses. The system also allows for “green” efficient electrical power management by using the motors as brakes that send electrical power back to the power grid and reduce energy costs by capturing braking energy.

By buying motors from a Georgia company instead of from overseas, the jobs are kept in Georgia and the USA while Georgia and the United States government collect the taxes paid by the

company and its local employees. Note that even though HighRoad and Silver Bullet are designed for different speeds, both use the same type motors. The difference is that although the electrical current remains the same, the torque and speed can be varied, giving one more push for heavier loads and the other more speed for a different assignment.

Safety

Passenger safety is first, and the systems were designed with that philosophy. Multiple station automatic trackside doors in a glass window safety wall open only when a stopped vehicle's doors are in a matching position at a station. The automatic doors are located in stations' trackside safety walls that protect passengers from the guideway except when boarding or exiting a vehicle. Safety also includes safe braking, so see the section on braking (below) for a more complete safety review.

HighRoad systems and management are generally (modified for the elevated guideway HighRoad technology) in compliance with Federal rules for railroad PTC (Primary Train Control) for automatic collision avoidance, automatic speed control and automatic braking, all actively monitored by Central Supervising Station personnel. Automated operation further increases safety by using electronic on-board speed and position management. In addition, the vehicle is expected to meet the passenger rail criteria established for crashworthiness of the Federal Railway Administration based on HighRoad's multiple automatic stopping operating systems with its 28.6 fps/s stopping power, double the FTA standard for buses.

Braking

Most transit and high-speed rail vehicles have good brakes, suitable for their weight, speeds and terrain, meeting Federal DOT standards. The HighRoad and Silver Bullet systems are designed to assure that in all cases the public will be safe. Typically, transit brake systems use hydraulic or pneumatic forces to apply a friction pad to a wheel by means of a disc or drum. Some also use regenerative engine or motor brakes which also apply braking to wheels.

However, such transit wheel braking is limited by the friction limits of wheel-to-roadway contact on the rail it rolls on. This limits a normal typical transit vehicle's ability to apply decelerative g-forces. Typical stopping ability is limited to the friction between a wheel and its running surface, and is based on the force (usually the force of the vehicle's weight) applied by the wheel to grip the surface. With HighRoad and Silver Bullet, the wheel applies its stopping forces with a steel-on-steel friction grip greater than typical automobile brake pads provide.

In addition to the drive wheel braking forces, HighRoad uses other, multiple brake systems. When all is added together, the braking capacity of a vehicle is a continuous 28.6 fps/s, based on 14.4 fps/s for motor regeneration, 6.9 fps/s stage 1 friction and 7.3 fps/s for stage 2 friction brakes, unlike other brake systems that can "fade" in use. Friction brakes are applied to the cool rail and therefore have a constantly reused cooling heat sink designed into the mass of the rail. All the

HighRoad and Silver Bullet braking capability is provided by the patented cantilever wheel arrangement, providing superior automatic braking in as many as 14 stages, considering that there four brake assemblies for each of two stages and 6 brake assemblies in the third stage. This huge safety feature exceeds the Federal D.O.T. standards for transit in all modes by a factor of almost 2 or more.

One characteristic of the systems is that a heavier vehicle will increase its braking proportional to its weight, making brakes more-safe at any of the vehicle speeds in use.

How Do These HighRoad and Silver Bullet Brakes Work?

Your safety is assured, applying brakes in multiple stages to the fixed rails smoothly is controlled by programmable logic controllers and decelerometers. Sensors that read data from track location identifiers cause brake controllers to be activated when the vehicle's speed is not appropriate for the vehicle's location on the guideway. Override controls manually input from the Central Supervising Station (CSS) can cause the braking to increase as needed for additional safety.

The basic method of braking is by motor speed reduction that uses electric power regeneration. This will be used for most braking, and is the preferred system. However, when additional braking is needed, friction brakes are designed for computer-application of hydraulic or electric force rod forces to friction pads, as used in buses, cars and aircraft. As the pads HighRoad slow a vehicle, they are cooled by their sliding on the cooler steel rails, and do not create "brake fade" since fade is caused by overheating brake rotors or brake drums on cars. When the brakes are not being applied electric actuators retract the pads from the rails, ready to be reapplied. All forces for braking are applied to smooth tracks which are attached to the guideway. A bonus is that the total braking is twice the standard of the FTA for transit braking rates.

Proven Technology

HighRoad and Silver Bullet technology is as demonstrated in operation of many illustrations found in American industry. Since they are made from the assembly of mostly off-the-shelf proven engineered commercial high-quality American products used in daily service, they are "component-qualified" (a method used in approvals of U.S. military and civil aircraft) as a safe and effective transit system. Replacement component-qualified parts are available even now in published catalogs, even before beginning operation in a HighRoad system.

Examples of these component products available now are seen in automobiles, airplanes, office buildings, manufacturing facilities, oil drilling rigs, other transit technologies and communications. HighRoad and Silver Bullet technology can be described as the application of proven technology in a new and more efficient, safer manner. This allows governments and private operators to select HighRoad and Silver Bullet technology with confidence since there is more assurance that the systems will work than with more expensive technologies produced overseas that use outdated equipment and older concepts of operation, or which may have quality or security concerns.

HighRoad and Silver Bullet quality components are designed to work well in America's fast-moving advanced society and advance the reputation of those government officials who move American transportation technology into the 21st Century.

Not Hackable

Operations are managed by a private, protected information and controls network that is not connected to the Internet and is intensely supervised by in-house operations experts. By avoiding public international internet connections, this private industrial internet system of HighRoad and Silver Bullet (and their similarly protected fare payment systems) cannot be hacked by outsiders. Multiple controls for each critical proven control element provide redundancy for reliability and security. Isolated data can be sent over the internet but not with critical operational and financial information. However, to assure critical transparency of the HighRoad and Silver Bullet systems, public information on system business operations will be made available on the standard public internet using limited data bridges as safety cutouts, as well as by new system security technologies. This security-by-risk-avoidance is the lowest cost way to design and safely operate any system.

Great Construction Jobs

HighRoad and Silver Bullet construction processes use highly-paid Civil, Mechanical and Electrical engineers and planners early in the multi-year projects, followed by the work of experienced designers, manufacturers and builders, providing tens of thousands of local high-skills jobs for many years. In later operations hundreds of other jobs will be open for vehicle and guideway maintenance, system operations management and high-level administration, in addition to the many other indirect jobs created within the community in support of construction and operation of the system. In the Atlanta region, the whole 365-mile transit system will take as many as 16 years to fund and build while providing over 30,000 direct and resulting jobs for each year they are building it. A 220-mile-high-speed rail line connecting Atlanta and Charlotte may take up to 6 years to build, providing as many as 6,000 new jobs each year. After that there may be additional jobs for expanded commuter services to other counties and regions, and for connecting Southern cities with a very-high-speed 220 mph Silver Bullet passenger rail system, a HighRoad-type system that shares the same tracks while using the safest speed for the shared usage.

Other Job Opportunities

HighRoad and Silver Bullet will help everyone. The thousands of people who design and build the systems will be spending their money, paying taxes, building houses and funding schools, churches and roads. But the HighRoad and Silver Bullet work will also provide customers for people in the communities who will open new stores and provide new services, as well as keep the existing stores open to serve new customers due to the increased mobility of the region. It will be essential to expand opportunities in the region that are not provided by traditional road

construction since there may not be a great deal of road construction because of its higher costs for each person traveling.

HighRoad Helps Provide Affordable Housing

Current slow transit and road congestion conditions within large cities can limit quick access by people to affordable housing opportunities. Since large components of high housing costs frequently are due to high land costs and property taxes in city centers, fast transit access to locations having lower land costs and taxes can allow more opportunity for affordable housing. However, using an automobile in congested traffic over long distances to get to these locations takes too much time, energy and money for many, especially if it is a recurring expense. HighRoad transit and Silver Bullet serving throughout a large state region allows travel with less time and money used, (about 35 cents per mile with HighRoad and 55 cents per mile per automobile according to the AAA) and allows a person the opportunity to seek affordable housing anywhere in the region without loss of job or loss of free time and unnecessary use of limited money. This efficient service to workers can also keep living costs lower while giving workers and employers more benefits.

HighRoad Helps Workers Find Jobs

Finding a job in a distant location is sometimes difficult since housing costs may dictate where a worker maintains his or her home. Having a low cost and high-speed means of accessing better job opportunities throughout the region offers potential for upward mobility of all people for all types of work and for increased income and job satisfaction. Employers can help workers find their open job opportunities that will be accessible to everyone in the region, resulting from having made making transit and commuter fares affordable. As an incentive, people may receive a tax-exempt (where allowed) part of their pay to cover costs of travel to work while allowing workers to reduce their housing costs.

HighRoad Can Help Employers Find Workers

A corollary to the above employee job access improvement is that the employers also can more easily find the employees that they need as well. The pool of prospective qualified workers is likely to increase as their ability to get to work at reasonable cost is improved. Employers can increase their access to qualified employees by providing transit fares reimbursement as part or all of the cost of bringing those qualified employees to them from all parts of the region and state. From a regional standpoint, more businesses may choose to move to the Atlanta region because of more ability to find qualified workers.

How the HighRoad Transit System Can Be Financed

The system can be paid for largely by a method known as "tax recycling" in which the taxes collected from the work performed on a project (Federal income tax and employer business taxes and State income tax and sales taxes) are plowed back into the project, keeping the project rolling, fueled by its own success, both a method of borrowing money that is quickly repaid through taxes. Other non-construction jobs in the community will be created to serve the construction workers, and their taxes also will be collected as recycled taxes from the project, re-loaned to the project. Workers' taxes for Social Security and Medicare will not be recycled but provided to the agencies charged with meeting retirement and health care needs of the future.

In addition to these recycled taxes the other funds needed is to be provided by P3 investing contractors and other investors who will buy tax-exempt revenue bonds issued by Federal agencies and backed by the fares from operation. As the system's riders use it, net earnings will be used to provide cash to pay off the construction debt, leaving the system completely debt-free, while providing additional income to the state and county sponsors for other transit services.

But a final precaution is presented here: In the absence of the State and Federal D.O.T. approval of this proposal, it may require direct Federal grants and State grants for construction combined with additional county sales taxes. Accordingly, without local governments' approvals of HighRoad in the region there may not be an Atlanta HighRoad system built, and a system easily-provided at this time may cause the counties in the Atlanta region to suffer economically and politically for many decades. The responsibility to consider this carefully is very important.

Paratransit Improved Method

The costs of providing paratransit services within a massively-improved paratransit service area in the region are included in estimates of operating costs, meeting all known Federal requirements as to speed of service, quality of service, and convenience to the user. This is done by providing each qualified paratransit rider with Fair-Fare Cards that will admit one rider and one caregiver to the station boarding gates for one round trip each per day (going and returning). No advance call and scheduling of a trip is required. The Paratransit Fair-Fare card also will serve to pay a "Ride-Sharing" service such as Uber or Lyft for a connecting ride from home to a station, from a station to a destination, and return. At the end of the trip the rider and caregiver will be able to return using the same services. This is expected to reduce paratransit costs by 75% and provide faster, more convenient and more valuable service to the rider. This cost is covered in the basic fares paid by all riders, and is based on the recent demands made on the MARTA rail system that are published by the Federal D.O.T.

Costs of this service may be reduced when qualified autonomous services are available. General Motors in 2022 has announced design, testing and production of Cruise brand autonomous vehicles that can be used for this service. Testing of this vehicle has been substantially completed.

How a High-Speed intercity Silver Bullet System Can Be Financed

Multi-billion-dollar high-speed rail systems can be paid for by proportional mileage-based state grants based on their related populations taxes collected from the project and its prospective riders, as well as the number of stations within the states. In addition, Federal grants based on the income and business taxes from the project plus other grants from the Federal Highway Administration. The balance would be covered by long-term revenue bonds, with payments made only from the fares collected. Analysis of Amtrak Northeast Corridor operations shows that only 72 riders per mile day may be needed since typical trips exceed the transit typical trip length of 10 miles. Because of its high-speed service at regular AMTRAK fares, it is likely that the 220-mph Silver Bullet system will have even more riders at a much lower fare and generate an operating cash surplus for other needs of the governing authority. A bonus is that by using a single low fare rate per mile for all hours of a day the system will allow access at any time of day or night without advance bookings, cutting a great part of the costs experienced by Amtrak and increasing its service to the public.

More Jobs and More State, County and City Revenue

Additionally, during construction these project workers in the state (our friends and neighbors) will have good jobs and better lives as a result. Also, other workers selling products and services to the project's skilled workers and contractors will pay individual income and sales taxes into the state and local treasuries. These taxes are a part of the effects of recycling and help to pay for the system. These project workers will also pay local sales taxes to the cities, counties and existing transit agencies and contribute to the region's prosperity. Since the system will be owned by government agencies that issue the revenue bonds, state sales taxes on construction materials used in the project will be eliminated in the public interest, helping to keep the system cost low.

More Federal, Social Security and Medicare Tax Income

Note that under the plan the Federal and state governments do not pay for the full systems, or even a small part of the systems. All the money loaned by them for construction will be repaid quickly as it is built from direct and induced jobs for workers in the state and elsewhere who will continue to pay their income, Social Security and Medicare taxes directly to the state and Federal governments. Note that the Social Security and Medicare taxes are not a part of the recycled taxes, providing full funding of these future costs of those programs. The remaining income and other taxes will exceed the Federal and state "loan" grants, while resulting in a fully-paid-for rail system. In addition, future jobs created from efficient use of the Atlanta HighRoad system by the region's population will continue to supply Federal and state treasuries with even more cash.

Seamless Transit System Operation

A regional HighRoad transit system can be seamless by matching individual county HighRoad routes with those HighRoad routes of adjacent counties, taking advantage of the potential fare-paying user traffic from other counties that helps income for all counties and provides benefits for all the people, regardless of county densities. Such a seamless single-technology system will provide faster and lower cost transit for all. And it can be made similarly seamless to commuter (higher-speed) HighRoad and high-speed rail Silver Bullet systems with simple extensions of the transit system guideways into non-ATL Authority counties, providing wide-area travel. With the inadequate funding that is likely with older technologies, such old tech systems cannot be regional and cannot be seamless, and cannot provide the benefits possible from use of HighRoad. This system can also be connected to other transit systems throughout the region's counties using the many HighRoad stations so that existing bus and rail systems can continue to operate as before but with additional connections allowing shorter routes and fewer subsidies needing to be paid. And by having a single guideway design for both HighRoad and Silver Bullet systems, both systems have more opportunities to serve the public.

24-Hour Service

Because HighRoad and Silver Bullet systems use many vehicles and will base vehicle maintenance in many different stations, (using the HighRoad maintenance plan) it is now possible to provide operating transit vehicles on a 24-hour basis, allowing riders to be able to depend on getting home after work, to an early-morning work shift, or to return home following a late entertainment or sports event. Even late-night medical emergencies can be assisted with stations near hospital emergency rooms. In this arrangement, although most vehicles will be serviced during the night for next-day operations, there will be vehicles available for over-night transit service needed by some many users. Consequently, it will be possible to operate the systems continuously and they can be available to all people at all times. Additional CSS staff will be added to handle this additional service, with that marginal cost covered by the added fares.

Easy Fair-Fare Payment

A proposed fare-paying system uses widely-held credit and debit cards as well as cell-phones for payment of trips on a per-mile basis, so that people making only short trips will pay only a small amount, and those who benefit from longer trips will pay proportionally more. This will be employed in both the HighRoad and Silver Bullet systems. By swiping or tapping a card or phone at a turnstile, the trip is begun; and by swiping or tapping the same card or phone at an exit turnstile the trip is concluded, all at lowest costs and with the simplest procedure for the riders, charging only for distance traveled, and helping to prevent "turnstile jumping". This is "fair-fare" charging. Special cards and cash are not used, simplifying the riders' daily life, and lowering the overhead costs of system operation. Fare collection is automated by the process and most collection features are already developed and in daily use. Other marketing considerations can be included in the software, such as special or no-cost fares for approved riders such as police

officers, system employees and special needs patrons. Traffic-counts and loading data from the payment system can be used for application in mobility-improving apps and services.

Fare Stability

The generally accepted 2020 rail transit fare in the Atlanta region is $2.50 per trip. For a MARTA rail trip in 2018 this distance averaged less than 7 miles, according to the Federal Transit Administration. That works out to be $0.36 per mile. Based on current planning a one-mile trip on HighRoad could cost $0.35 to $0.39 per mile. For a 7-mile trip the fare at $0.36 would be $2.50, the same as the current subsidized MARTA average. So, the present fare rate could stay the same as the MARTA rail and other bus system fares for similar trips. But if a person wanted to travel 10 miles or more on the faster HighRoad rail system the fare would be $3.50 or more, while the longer-trip rider could save time and have many more opportunities for jobs and housing. Another benefit is that as ridership increases above the planned service estimates, the fares may be allowed to remain constant, and not increase.

Crime Management and Security

Police are sometimes needed on a transit system, both in vehicles and in stations. The existing local police departments and sheriff's deputies are to be used for HighRoad's public safety maintenance as a part of their departments' normal responsibilities and because they have full civil government policing authority and extensive qualifications and training in police work. The CSS staff will record security camera videos and sound monitors in each station and vehicle, and they, as well as the public, can call attention to any police or EMS services needed and immediately direct them to that need. To facilitate the public's awareness of the security they have on the system, all police officers and sheriff's deputies will have free access to use of the system at all times, whether in uniform or not, and this will be publicized.

The stations and vehicles will not be identified as "gun-free zones" since that can invite safety challenges. Peaceful riders will have "right-to-carry" as long as they are in compliance with state and federal laws concerning licensing of firearms, knives, mace, clubs and other potential weapons. Since security is important to riders, all riders will be prohibited from wearing concealment masks or other means of obscuring recognition devices such as cameras. Instead of masking during epidemics the vehicles will have virus-eliminating heating and air conditioning systems. Vehicles and stations will have an emergency telephone connection to the CSS staff and to 9-1-1 services. Using local police services (already provided in budgets of each county and city from taxes already paid by the transit riders) instead of a transit system police department saves a great deal of operating funds each year, while improving safety and services.

What Happens When Guideway Power Goes Off?

The vehicle will come to a quick stop as brakes are automatically applied. However, you will have backup battery power for full lighting in the cabin and full controls operation and telephone connectivity. Also, vehicles can be pushed (if needed) from a service vehicle running on the top of the guideway. And with all four doors capable of being opening by hand in an emergency, passengers can move to the doors near the guideway and cross the small gap (using the automatically-deployed vehicle gap cover) to the guideway top surface while waiting for power to be restored. Since the power will come from main lines a power outage is much less likely than in a small neighborhood.

What Happens If Station Power Goes Off?

When that happens, you may see a small "blink" as the station's large generator kicks in and power uses are automatically transferred from outside lines to the station's generator. Lights will stay on, announcements will be made, doors will open and close as usual, and an elevator will continue running. Even the station heating will keep going in the wintertime.

A Little Help for Our Schools and Universities

By planning routes for local convenience as well as for regional transportation, the HighRoad system can help local and regional schools and universities by providing a means for students to travel economically and quickly along the system, possibly reducing some local school bus trips and other transportation and parking lot construction and maintenance costs accordingly. School buses may be used more economically for distribution of local students from HighRoad stations to neighborhoods and by giving them special field trip options otherwise not available. And by using HighRoad technology the counties will enable our schools and region's universities to share facilities while continuing to use limited tax funds for their facilities' maintenance and improvement instead of having to use older, inefficient, and slower transit technology.

Administration and Maintenance in Stations

Stations are not just for arrivals and departures. In order to save construction funds, operate more efficiently and avoid wasted time, all vehicle maintenance is to be provided in otherwise unused space in stations. All transit system management offices are to be accessible within stations. And all offices for executives and operations also are to be located in additional unused space in stations. This also allows personnel quick access via the HighRoad system with all-electric vehicles and stations throughout the system without use of slower and more expensive automobiles. To provide local control for safety and operations the entire system is divided into multiple service and administration zones and for multiple Central Supervising System management teams, also located in a HighRoad station. And as a bonus, by offering vehicle service in stations there can be many vehicles available 24 hours around the clock for constant transportation availability for the public.

Track De-icing for Winter

Electric heat wires controlled by thermostats are provided adjacent to the rails with automatic-on switching when track icing conditions exist. This de-ices the track and helps in snow removal by mechanical means to keep the tracks smooth and open in all weather in all climates. Ice and snow melt are allowed to fall from the guideway as if incidental rain. The overhanging guideway upper surface protects the electrical power bars and upper rail from added snow and ice accumulation.

Robotic Track Inspection

Robotic sonic and visual inspections are to be provided by existing technology robots for track condition data gathering. Robots will retain inspection memory and pictures for maintenance staff review and action as necessary. Robots also can be used for hazard and security inspections and for quality assurance of repairs after completion. Robotic inspections will be supplied by specific passenger vehicles that contain inspection equipment in special under-cabin bays.

Station Locations

Stations of 12,800 square feet (divided on two floors) can fit anywhere that they are needed since only 6,400 square feet of land is used for station footprint in addition to adjacent land for access lanes and parking. Commercial retail shopping centers, education centers, individual businesses, hospitals, associations and communities can add stations and provide associated parking in combination with their existing parking provisions in order to increase their business or customer convenience. Medical and government office locations can be used for station locations as well since they can be beneficiaries of transit and intercity patron's quick and convenient access. And as a bonus for local bus transit systems, the HighRoad stations can be used as bus transfer and waiting stations, fully heated and air conditioned, with restrooms, refreshments, and even bus arrival schedules displayed with pending bus departures announced. The stations also will be convenient passenger connection points for taxi, Uber and Lyft plus easy connections with local government buses

Right-of-Way

Guideways can use existing public roads plus other property air rights where needed, with less community disruption than with other systems since most major components are fabricated off-site, and installed primarily by lifting and launching processes. Only work on foundations, launching and finishing of elevated guideways will be needed during construction, allowing less construction disruption in the community and to the businesses and population in the area. Less need to move earth will make installation work shorter and more efficient. Purchases of land for right of way can be minimized by use of existing government-owned roads parkways, centerlines and roadside properties. Other land can be purchased and landowners can be fairly compensated

where air rights are needed adjacent to roads. Using roads for rights-of-way will make guideway beam segments more accessible for installation.

Station Descriptions

Stations are to be enclosed 80' x 80' two-story buildings designed for easy boarding and exiting to and from vehicles at enclosed heated and air-conditioned elevated passenger platforms, co-planar with the vehicle cabin floors for easy roll-on roll-off access. Stations will be designed for your comfort, with heating and air conditioning, dual ADA (disability accommodation law) elevators, standby generators for building services, food and beverage shops and vending machines, water fountains, large ADA compliant public toilet facilities and water fountains, slip-resistant floors, high open ceilings, bright lighting, escalators, ticketing turnstiles in and out for additional ADA compliant services, administration offices, Central Supervising Station (CSS) offices and vehicle maintenance bays, including vehicle washing and doors for vehicle entry to boarding platforms and service spaces.

Boarding and exiting platforms will have trackside safety doors, access to walkways on guideway (by staff only) and weather protection. Add to that a small service vehicle on the guideway top surface that can be available for access by authorized staff. Security high-definition cameras and continuous station sound monitoring is to be monitored by CSS security staff. Signage, kiosks and speakers will be provided for current passenger services notifications. Automatic entrance doors are to have proximity sensors allowing full, wide and easy wheelchair access. All door thresholds are smooth and doorways are wide. Air conditioning and generators are to be roof-mounted for ventilation and protection.

Flood and High Wind Protection

Resistance to wind is built into the guideway's elevated design with its strong heavy steel reinforced concrete. The guideway protects the vehicles by having them securely attached with their steel cantilever motors and brake system structure. By knowing the anticipated height of potential flooding water, the guideway can be built at a height that avoids flooding damage. Electrical power connections will be mounted on columns at heights to avoid potential flooding damage. Also, systems communication cabling conduit can be enclosed within cable trays built into the top of the concrete beam casting.

What About the "Never-Been-Built" Question?

HighRoad is a new way of assembling proven parts to provide a superior transit technology! It looks like a monorail, but it isn't. It combines heavy rail stability with its quiet steel-wheel-on-steel-rail, state-of-the-art aircraft type controls, fully-developed high torque industrial motors, and composite aircraft-type vehicle bodies built like roomy passenger airplane fuselages. Even the

Federal government calls it “novel” and has set up special approval paths for other such transportation improvements. They have even given us an OK to submit data for approval to the Atlanta FTA District Office. And another aspect of HighRoad is that its system of hundreds of track miles (managed under guidance of the TransPlan analysis and operations system) can guide its daily task of moving hundreds of thousands of riders like you faster to more places than ever before.

Is This an All-American System?

Yes, it is, at this time almost all parts and service are provided in the U.S.A. The American products are technology (Georgia), vehicle design and manufacturing (Georgia), controls (Georgia), motors (Georgia), motor drives (Georgia), precast concrete guideway (Georgia), building construction (Georgia), architecture and engineering (Georgia), and guideway construction (Georgia). In addition, the rails are from nearby Alabama, some actuator parts are from Pennsylvania and Michigan, escalators and elevators are from South Carolina, and the concrete-supporting bridge bearing pads are from New York. All other steel and commodity parts are to be procured within Georgia and generate Georgia jobs and economic development. The system will comply with Buy-American laws. Also, quality is a concern, and American quality is preferred.

How Many Will Use the HighRoad?

Predicting human behavior from one week to 20 years is very difficult. Although experts say that they can do it, history frequently has shown that to be in error. As a variation of the analyses done by others, the HighRoad analysts have used the long-term past transit usage of the heavy rail usage by MARTA passengers as a guideline defined as “Predictive Analytics”. Beginning with FTA figures for 2019, we reduced those figures to rational ratios, such as passengers-per-mile per day compared to miles of rail service available, and share of populations that are likely to use rail transit in comparable city populations. For MARTA that worked out to be over 5,468 daily riders per mile per day. HighRoad analysts used 3,281 as a guiding figure, which added a 66% margin of financial stability to the analysts’ calculations. But that is considering system capacity only. To be even more accurate the riders per county per day was calculated compared with the total populations of the most-served county (Fulton) as a base line. The calculated result was that 19.8% of the system’s trips were from twice- daily (round trips) from entire county population. They used the system for an average of less than 7 miles per trip on the 47.6-mile limited system. Analyses of other comparable large U.S.A. cities showed similar usage rates. Since the counties have increased their populations during the two years after the analysis, it is safe to say that the ridership analysis understates the prospective ridership.

Just to verify a conclusion that counties with a more-dense population spread would have sufficient riders to justify HighRoad’s implementation, other county densities were compared. The data (from the Atlanta Regional Commission) showed that DeKalb, Cobb and Gwinnett counties were more densely populated (2,665, 2,148 and 2,028 residents per square mile, respectively) than Fulton at 1,892 per square mile, and were more likely to have a higher percentage of

residents using the HighRoad system if one is built. (Clayton County at 1,858 was not far behind). With this being a conservative analysis, the Fulton County standard was used by HighRoad designers and analysts as the basis for future HighRoad usage, and the financially-sound HighRoad ridership rate of 3,281 per mile per day was used for predicting track mileage needed for the ARC population estimate for 2040.

Since 2019 the populations of all the counties have risen as the Atlanta region's population has grown, resulting in even greater density. For clarity the method used for estimating ridership is validated from a method identified as Predictive Analysis of Large Homogeneous Populations.

A Pleasure to Ride

HighRoad transit vehicles and Silver Bullet High-Speed rail vehicles provide passengers with a great view through large windows since they are elevated above surface traffic, run along normal roads, and are not subjected to only industrial area views. As a vehicle passes over all other ground-based traffic at high speed the passengers will be assured that it exceeds all its competition for speed, safety and convenience. As seen from the highway below, it will encourage slower surface travelers to consider HighRoad transit and Silver Bullet intercity high-speed rail.

What About County Tax Money Collections?

In recent newspaper articles it was reported that one county in the Atlanta region found that its 1% transportation sales tax (T-SPLOST) over the latest 6 years (including 2020) actually collected 18% more than it had estimated. This is probably due to increased building construction, plus more business activity from population growth and a small amount of inflation. Since most people in the counties in the Atlanta region are similar in spending habits, and the Atlanta Regional Commission expects that the counties will increase population by 40% in the next 20 years in 2040, and since inflation, even if low, will increase the dollars collected to keep up with government planning, the T-Splost money (Used for non-HighRoad transportation projects) is very likely to be in place to fund continuing maintenance of existing county transit, and building of new roads, bridges and sidewalks, and would not be needed for HighRoad. Add to this the county income growth effects provided by a regional HighRoad system, and you can see that the risk of county tax shortfall is very low if HighRoad is paid-for from Federal and state tax recycling, P3 funds and operating revenue bonds, and does not draw from the local taxes. So, not having to pay for regional transit with added taxes is a good idea. It helps keep the county governments solvent while improving transportation at no net cost either to the Federal or state governments. All it takes for success of all participants is approval of HighRoad.

What About the Existing County and State Bus Systems?

They will just keep on going as before, with all the costs that are not covered by the fares continuing being paid for from your existing county taxes and fares. HighRoad may improve joint

use by connecting to some of the less-used bus routes at all HighRoad stations, and some new ones may be added to the plan, so that the county transit systems can serve all the people fairly. Intercity buses will not be affected.

And Who Will Operate a HighRoad System?

It all depends. Each county or Official Sponsor is to tell the ATL Authority who it wants for the operation of its county transit system, and the ATL Authority is to make the selection decision. If a region-wide HighRoad system is desired by the counties, then its operator must be able to supply the HighRoad technical knowledge that operating such a large system will need. The HighRoad team intends to supply that knowledge to its representative operator only under the licensing agreement binding the team into a coherent well-managed organization, and that operator will be best-qualified to perform that service.

Who Profits from Selecting the ATL HighRoad?

Everyone! The riders get a regional system under a financing plan that does not cost the people, counties, the state, or the Federal government anything, except normal fares paid only by riders. Any taxes recycled are recovered quickly and revenue bonds are paid off by operating fares over 35 years in a typical long-term mortgage-type arrangement. So, everyone profits from HighRoad.

Who Loses if HighRoad is Selected?

No one. Even HighRoad won't carry more than about 19% of the region's traffic based on current practices; it will just carry that traffic that is not handled by personal automobiles and other transit modes. So, highway builders will still have plenty or work to do and the people will get the roads they want to handle the region's increased roadway traffic. The difference is that for each HighRoad mile in service the capacity will begin with the equivalent of about 1.5 lanes of road per side, or 3 lanes of road total. In contrast, the HighRoad is not likely to be stopped by congestion or car wrecks. And the HighRoad riders will move along at 85 miles per hour, hard to do now in the region's traffic (legally) at rush hours.

The good news is that over time, HighRoad can add transit vehicles by a factor of 10, and it will provide the service of the equivalent of a no-cost 30-lane road throughout its 372 miles of the region.

A Little Bragging

If the FTA and the ATL Authority both approve HighRoad, then Atlanta will have America's second-longest mileage of transit of any city. Only New York City will have more. And Atlanta will be able to expand without costing the governments anything. New York City can't do that with its old train technology.

A Special Benefit with HighRoad

There is some discussion ongoing regarding using the HighRoad companion high-speed Silver Bullet to connect distant cities and states with the Atlanta region. With a HighRoad network of 365 miles around the region it will be very convenient to board a HighRoad vehicle, quickly move to a Silver Bullet station closest to the high-speed rail corridor, and proceed on a trip, quickly, efficiently and economically. No other transit technology offers this benefit. The largest station closest to the Atlanta-Charlotte line is in Lawrenceville. The largest station closest to the Atlanta-Chattanooga line is in Marietta, and stations closest to Macon would be Jonesboro and closest to Columbus would be Newnan.

Lyft and Uber

These operations are widely used and can be used in the future to advance "last-mile" convenience. In fact, a recent study showed that it may be possible that use of these type services can add sufficient marginal ridership to a HighRoad system to make major offsetting financial contributions to the transit system, paying a part of low-cost Lyft and Uber- type systems for first and last mile services.

Operations Jobs

Shortly before the system is completed your HighRoad and Silver Bullet operating teams will be hired, trained by experienced specialists in classrooms and in actual maintenance facilities. The teams will be trained in vehicle maintenance, guideway operations, safety and in general management. These skilled people, many with related prior transit experience, will form the operating team, finally graduating as experienced specialists, highly-paid, and committed to HighRoad and Silver Bullet excellence. They will be the key parts of the HighRoad Operations Team.

Job Details

First on the Operations Team will be the group who will learn the procedures for controlling the vehicles on the guideway. They will be spacing the vehicles to maintain an orderly flow of vehicles from station-to-station and to assure that the vehicles provide frequent and predictable services to the public. They also will monitor (with the help of computers) the speed of vehicles and their speed along the guideway at any location, assuring "positive control" as required by federal rail regulations. They will be notified, again with the help of computers, of vehicle doors opening and closing while being stopped in stations. Also, they will always be notified of actual vehicle speeds and know the average travel speeds that are being provided to the passengers. And as part of

their jobs they will be trained in handling situations on vehicles and in stations that require quick local first-responders' attention.

More Jobs

An equal part of the operating team will be the maintenance people who keep everything in good order. From the people who keep things neat and orderly to the electronic technicians, the team will be well-trained, competent, experienced, and well-compensated. Competition for these jobs will be strong, and to have these jobs will be a coveted goal. A large pool of pre-trained military veterans is available for meeting this need.

Management Opportunities

Every organization needs management leaders, and these leaders will be assigned to multiple geographical areas within the region that are part of the larger system. This will allow each regional leader to concentrate his or her services for the people of the region. This also makes the management more accessible and accountable to the people within that portion of the transit system under the management. On the management's staff will be his/her financial and accounting consultants, his/her procedures and controls staff specialists, and his/her maintenance staff, including those assigned for general cleanliness, guideway repairs and inspections, and vehicle maintenance. At this time there are no individuals or companies qualified to provide operation management of HighRoad other than the original technology-providing engineers and planners. However, by tapping into the existing pool of qualified transit and other transportation professionals these roles can be filled, and through them a more successful program be completed.

Apps

By carefully connecting the system operating status reports (location, speed, headways, etc.) electronic apps can be formed to give riders info about the system to help them find where they are going and how long it will take to get there, the "fair-fare" that will be charged, as well as up-to-date information on operations and even articles on highlighted employees who deserve recognition. Since these apps will be connected to the internet, Federal government type controls similar to those used for nuclear facilities will be used for isolation security.

And More to Come

The public can look forward to seeing HighRoad and Silver Bullet as parts of a transportation system growing with three transit variations; HighRoad transit rail at 85 mph (or higher), limited-stops HighRoad-Plus commuter rail to outside-the-region counties at 100 mph (or higher), and high-speed Silver Bullet rail connections to other regions and states at 220 mph. All Silver Bullet passenger systems can have seamless connections to HighRoad transit system guideway and station infrastructure, regardless of top speed or number of passengers. Also, planned for the

future is a high- speed intermodal standard freight container carrier system with speeds of 120 mph or higher, (HighRail) using the HighRoad technology platform on its own HighRail guideway.

The future looks good!

PART K – INFRASTRUCTURE AND JOBS ACT, HB-3684, Review and Analysis

PASSENGER RAIL FUNDING LAW HR-3684– NOV. 15, 2021

What's in the Infrastructure Package for Passenger Rail? (Updated)

Written by David Peter Alan, a *Rail Group News* Contributing Editor (Published 11/16/2021)

OTG added emphasis shown with yellow highlighting and underlining.
OTG added comments shown with blue highlighting and underlining.

The article has been reformatted by OTG to bring transit subjects forward and move administrative and Amtrak subjects to follow those paragraphs.

OTG is also providing opportunities to the FRA to provide affordable intercity high speed rail travel using the same HighRoad technology.

It's the big news in Washington and everywhere else in the country. The Infrastructure Investment and Jobs Act for which the Biden Administration had fought so hard and made so many deals finally made it through Congress on Nov. 5, and President Joe Biden signed it into law on Nov. 15.

It has provisions about energy, fuel technology, cybersecurity, broadband, drinking water and wastewater, efficiency in building construction, and several other issues. It is a huge document, totaling about 2,700 pages of text, and reviewing only the provisions that relate to passenger rail required several hours.

Accordingly, this article cannot serve as a thorough guide to the rail-related provisions. It can only provide a brief overview of the relevant parts and where to find them. A thorough analysis of only the rail-related provisions would fill a book. A detailed analysis of the entire package would require a multi-volume treatise.

There has been a great deal of reporting about the package everywhere in American media of all sorts, especially the difficulties the Democrats have had moving it and the companion "human infrastructure" bill (still the subject of negotiations) through the legislative process, in light of the strong Republican opposition to both. Still, 13 House Republicans voted for the infrastructure bill and only six Democrats opposed it. There is no point or even relevance in reporting about the

politics of it here, but there are many provisions concerning Amtrak and a few that pertain to rail transit. So here is an overview of what Congress recently passed and the President signed.

The package is designated H.R. 3684 and titled the Infrastructure Investment and Jobs Act (IIJA). There are a number of other Acts contained within it, including the Surface Transportation Act of 2021 (codified as Division B of the overall bill). The full text of the legislation can be found at

https://www.congress.gov/bill/117th-congress/house-bill/3684/text.

Many of the provisions amend prior legislation, and many others set procedures for making decisions about infrastructure-related issues. Still others authorize spending of appropriated funds over the next five years, during the current fiscal year (FY22, which began Oct. 1), through FY26. If you wish to learn more about specific provisions, there is a Table of Contents at the beginning of the text; this article will provide section numbers for some of the most-pertinent provisions concerning rail. That means passenger rail: regional/commuter, Amtrak and transit. There are also a number of provisions concerning freight rail, which lie beyond the purview of this article.

The vast majority of the transportation-related provisions concern highways, as can reasonably be expected. I will not dwell on that topic, but it is noteworthy that Title I (at §11101(a)(1)) sets the amount authorized for federal aid to highways, starting with $52.488 billion in FY22 and increasing to $56.815 billion in FY26 (with $53.538 billion, $54.609 billion, and $55.701 billion in FY23, 24 and 25).

Other provisions relatively early in the document concern loans for infrastructure improvements. Section 12001 in Title II mandates changes in legislation from 1998, while §11101(a)(2) provides $250 million per year in TIFIA (Transportation Infrastructure Finance and Innovation Act) loans, an amount less than one-half of 1% of the annual highway appropriation. Subtitle C of Title I of the Surface Transportation Investment Act, beginning at §21301, introduces new procedures for RRIF (Railroad Rehabilitation & Improvement Financing) loans that are detailed in Chapter 224, beginning at §22401. These may be funding sources for HighRoad under joint FTA and FRA sharing of loan guarantees.

Provisions for Transit **This is very important to HighRoad's financing.**

Division C, which starts at §30001, is about transit. Its provisions concern transit generally, with little that specifically refers to rail transit, especially light rail or streetcars. The current phrase is "fixed guideway" systems, which include busways, as well as local rail transit. "Commuter" rail, a term that the aftermath of the COVID-19 virus appears to be heading toward obsolescence, is covered in some of the rail-related provisions described earlier.

Probably the most important section about transit is §30017, which specifies authorizations for transit during the next five years under 49 U.S.C. §5338, and also specifies how such grants are allocated. The amounts are: $13.355 billion for FY 22, $13.364 billion for FY23, $13.990 billion for FY24, $14.279 billion for FY25, and $14.642 billion for FY26. Comparing the percentages for transit to the combined highway-plus-transit totals for the next five years, it comes out to 19.4%, 19.0%, 20.4%, 20.4%, and 20.1% for each of those years. The American Public Transportation

Association (APTA) has historically campaigned for a 20% modal share for transit, and that share has traditionally been lower; often about 18%. Transit's percentage will make the 20% benchmark during the time the new statute is in effect, but the question remains whether a 20% modal share of appropriations for transit is sufficient to fight climate change, environmental degradation and class-based disparities in mobility by strongly encouraging more Americans to use transit as an alternative to constant automobile use, or to improve mobility for persons who depend on it.

HighRoad does not use any of the Federal funds described above except as one-month recycled cash collected from the project that are immediately loaned to the project and recycled once again. At the end of the construction project all the cash loaned will have been captured and deposited once again in the U. S. Treasury. Net cost to the Treasury is the one-month interest on the one-month amount of the money while it is being used temporarily for the project.

Sections 30002 through 30004 set rules for metropolitan planning organizations (MPOs), which engage in planning at the local level and approve grant requests to the Federal Transit Administration (FTA), although there is no requirement that MPOs be required to include persons who depend on transit or advocates for better transit as members.

Section 30005 is concerned with fixed guideway capital investment grants, which would include rail transit. The provision contains a number of amendments and new procedures, including a new practice of "Immediate Bundling" as described in §3005(a)(5), which makes it easier for an applicant to bundle two or more related projects together. That provision will smooth the path for applicants to ask for grants for several components of a mega-project (like the proposed Gateway Program between New York's Penn Station and nearby New Jersey), but would also make it difficult to downsize or otherwise change a project in response to changed circumstances (such as the current downturn in traditional "peak-hour" commuting, which would reduce the need for commuter-oriented infrastructure).

Section 30007 deals with "Public Transportation Innovation" but not specifically in regard to rail. There is a higher-education component to the program, although much of it deals with electric vehicles, especially buses. There are other topics in the transit-oriented provisions, including transit in rural areas, bus testing facilities, transit-oriented development (TOD), safety issues, state-of-good-repair grants and provisions relating specifically to the Washington Metropolitan Area Transit Authority (WMATA, where there are several rapid transit lines).

As expected, the transit industry lauded the passage of the bill. APTA released a statement saying: "This legislation is vital to building the American infrastructure of the future and is a necessary step in providing the transformational investment in public transportation infrastructure that our country so desperately needs" and "this bill will build infrastructure that will make public transportation faster, more modern, and more reliable, while tackling climate change, advancing equity issues, and providing growing communities sustainable mobility options. These are issues we can no longer ignore, and with enactment of this legislation, the public transit industry will be uniquely positioned to address these issues head on."

John Cline, Director of Government Affairs for the Commuter Rail Coalition, which represents the nation's regional/commuter railroads, sounded a more cautionary note. He said this in a "Washington Update" memo to members: "A key footnote to all this however deals with the importance of enacting a FY 2022 Appropriations bill. As you know we are currently operating

under a Continuing Resolution [CR] that is set to expire Dec. 3. If the parties are unable to resolve their differences, we could end up with one or multiple Continuing Resolutions that extend through the end of the fiscal year." He added: "If an annual appropriations bill is not enacted, the additional funding envisioned in this infrastructure bill could be at risk, because as you know, CRs generally restrict spending to the previous year's spending limits plus some marginal inflationary allowance. That is the structure of the CR we are operating under currently."

For riders on Amtrak and transit, the bill could also prove to be a mixed bag. More money should mean more trains and more transit but, in these inflationary times, there is always the question of how far the authorized funding in the bill will really go toward enhancing mobility for persons who depend on transit and Amtrak, or toward providing a viable alternative means of transportation for motorists.

OTG proposes that transit rail, commuter rail and intercity high-speed rail be provided as separate projects under a joint umbrella of FTA, FRA and Amtrak administrations, with FTA being the lead agency. They are mentioned here for consideration of the Atlanta HighRoad project as a leader.

Provisions Related to Amtrak and Passenger Rail Generally -

This is very important to the FRA, FRA, FHWA (highways) and Amtrak uses of Silver Bullet technology to help in improving national intercity transportation.

Title II of the legislation, beginning at §22001, is the Passenger Rail Expansion and Rail Safety Act of 2021. It includes grants to Amtrak (§22101) and the FRA (§22102), funds for consolidated rail infrastructure and safety improvements (§22103), a railroad crossing elimination program (§22104), restoration and enhancement grants (§22105), a federal-state partnership program for intercity passenger rail grants (§22106) and Amtrak's Office of Inspector General (OIG; §22007).

Amtrak's authorizations for the Northeast Corridor (NEC; at §22101(a)) begin at $1.57 billion for FY22 and decrease to $1.1 billion for FY23, then rise to $1.2 billion for FY24, $1.4 billion for FY25 and $1.5 billion for FY26. The authorizations for Amtrak's National Network under §22101(b) start at $2.3 billion for FY22, decrease to $2.2 billion for FY23, and then increase to $2.45 billion, $2.7 billion, and $3.0 billion for the next three years, respectively.

Amtrak's cash needs for $5.6 billion total to pay for a Federal share of the project can be done with OTG Silver Bullet technology and financing. The above law allows $6.77 billion for Amtrak's building of 457 miles of HighRoad to replace the Northeast Corridor line and repair its existing leased lines for that service. By using Silver Bullet it could reduce the present operating losses, improve speed and frequency of service between D.C., New York City and Boston (and the states and smaller cities between these major points) and still maintain the existing lines. The analysis is already done and ready for review. It uses Federal and State recycling of funds, P3 funds, and FTA/FRA/FHWA and Amtrak annual fund grants as above to build the system within a period of 11 years from initial funding. Note that the money is used twice, first for building Silver Bullet with one-month small repeating loans just like HighRoad financing, while using the HR-3684 funding for the balance of their mission needs. See "Amtrak Reform" below for Amtrak's new missions.

Comparing funding levels, the national network will receive about 1.5 times the NEC authorization for this fiscal year, exactly twice the NEC authorization during the next fiscal year, and slightly more than double the NEC amounts after that. There are also grants for the State-Supported Route Committee, the Northeast Corridor Commission, and Interstate Rail Compacts. Some of that money is provided specifically for accessibility upgrades and corridor development.

Amtrak Reform

Subtitle B, beginning at §22201, calls for certain reforms at Amtrak. Perhaps the most significant is a change in Amtrak's mission, noted at §22201(a). The new legislation amends 49 U.S.C. §24101(a) to strike a former mission statement that Amtrak "achieve a performance level sufficient to justify expending public money" and substitute a mission statement containing the words "in order to meet the intercity passenger rail needs of the United States." Both intercity passengers and commuters are now considered important constituencies, as are both rural and "major urban" communities. Other new language states: "Long-distance routes are valuable resources of the United States that are used by rural and urban communities." This change in Amtrak's stated mission may be one of the most significant developments in the entire bill; at least in theory.

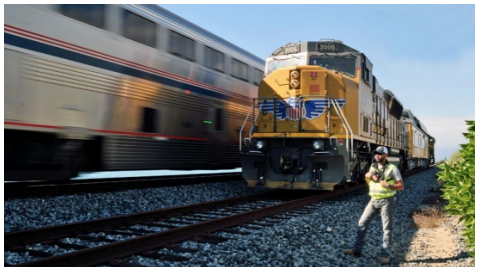
Amtrak also has new Congressional direction toward achieving its goals, under §22201(b)(1), which appears to eliminate the long-hated micro-management provisions championed by former Republican Rep. John Mica. It replaces them with new orders for Amtrak to "use its best business judgment in acting to maximize the benefits of Federal investments," also specifying some examples. They include: "offering competitive fares, increasing revenue from the transportation of mail and express, offering food service that meets the needs of its customers, improving its contacts with rail carriers over whose tracks Amtrak operates, controlling or reducing management and operating costs, and providing economic benefits to the communities it serves" (letter designations omitted).

Amtrak is also "encouraged to make agreements with private-sector entities and to undertake initiatives that are consistent with good business judgment and designed to general additional revenues" (§22201(d)) to achieve its goals.

One of those goals, stated in §22202(b)(4), is "to support and maintain established long-distance routes to provide value to the Nation by serving customers throughout the United States and connecting urban and rural communities." Ironically, the number of such routes operating today will remain frozen at their current level, because the new legislation fails to repeal the provision of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA), which defines the "national network" as consisting only trains whose routes were at least 750 miles long, and which were running when that legislation took effect.

The FRA may be interested in improving Amtrak performance and costs by adopting HighRoad technology for 220- mph intercity rail lines that serves major city terminal locations, enroute rural county centers, and suburban areas needing more rail transit that can also be passenger-feeders to the high-speed intercity rail lines. Analyses are already prepared by OTG.

Changes to the Amtrak Board and Other Provisions



The Amtrak Coast Starlight passes a Union Pacific train near Sea Cliff, Calif. UP photo

There will be some changes to the Amtrak Board under §22202(a). The most interesting might be in §22202(a)(1)(A), which replaces the President of Amtrak with the Chief Executive Officer as a Board member. David Gunn had gotten flack when the President was added to the Amtrak Board while he held that job. The positions were split recently, with Stephen Gardner as President and William Flynn as CEO. The placement of Flynn on the Board instead of Gardner may come as a surprise to "Amtrak watchers," especially those who are familiar with Gardner's long record as a political operative.

Otherwise, there will be one Board member with a disability, who is familiar with accessibility issue in passenger rail or commuter rail (§22202(a)(1)(B)). Other members will be geographically diverse, divided among those who live along the NEC, long-distance routes and state-supported routes. This Board member may appreciate that HighRoad and Silver Bullet systems are fully ADA compliant, offer 24-hour "anytime" service and exceed ADA requirements.

Section 22203 requires Amtrak to maintain ticket agents at stations that were staffed as of Oct. 1, 2017 (when a number of agents were removed) and which averaged 40 or more daily boardings and alightings during FY2017. Section 22204 increases oversight of changes to long-distance routes, including requiring "a detailed description of any plans to permanently change a route's or a service's frequency or station stops for the service line" (§22204(b)(2)(B)). This seems to anticipate the introduction of the 220-mph Silver Bullet on Amtrak lines such as the Northeast Corridor between Washington, New York, and Boston.

Section 22205 calls for increased oversight of Amtrak's accounting, while §22206 calls for increased oversight of Amtrak's spending, with detailed procedures to monitor such spending. Section 22207 calls for "Increasing service line and asset plan transparency" and also contains detailed procedures for achieving that objective.

Section 22208 concerns "passenger experience enhancement" and, significantly, strikes Mica's old restriction about food service that specified "only if revenues from the services each year at least equal the cost of providing the services" (§22208(a)). Otherwise, there seems to be little in the legislation that requires immediate changes. Rather, §22208(b)(1) establishes a "Food and Beverage Service working group" to study and report on proposed changes. It would include representatives from Amtrak, the unions representing workers who provide such on- board services, participating states when considering such services on state-supported trains and, significantly "nonprofit organizations representing Amtrak passengers" (§22208(b)(a)(2)(C)). This could be a significant

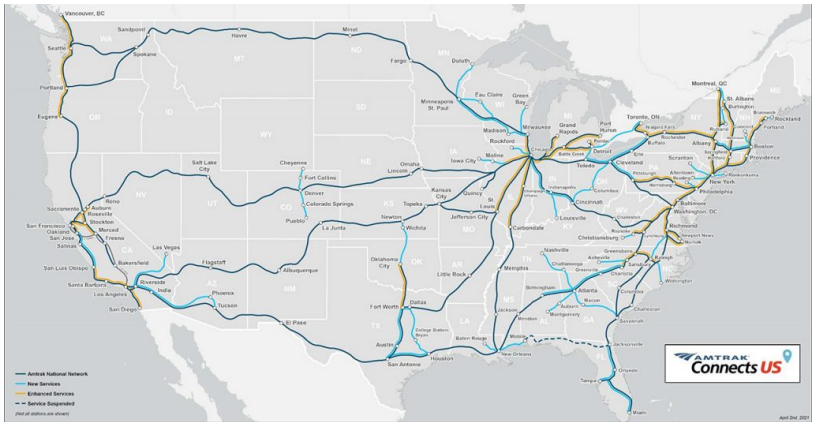
outreach to the organizations that advocate on behalf of Amtrak's riders. Currently, the two such organizations of national scope are the Rail Users' Network (RUN) and the Rail Passengers Association (RPA). With the requirement for such membership stated in the plural, rather than the singular, it appears that Congress is requiring Amtrak to reach out to those two organizations when it comes to improving food and beverage service, at least eventually. The bill did not address Amtrak's current practice of restricting dining cars to sleeping car passengers only and regularly reminding coach passengers of that fact with numerous announcements throughout the day. The Silver Bullet high-speed line designed for Amtrak does not have sleeper facilities since it operates at 220 mph and at present is planned for quick trips and has food service vendors at all stations. Coffee/Snack service is available on these lines if desired and the earnings from the service will pay the costs of an attendant providing the service.

Section 22209 provides a concrete enhancement of the customer experience: prohibiting "vaping" as part of its ban on smoking.

Section 22210 is headlined "Protecting Amtrak Routes Through Rural Communities" and essentially reaffirms prior policy. It says: "Discontinuance or Substantial Alteration of Long-distance Routes: Except as provided in subsection (c), in an emergency, or during maintenance or construction outages impacting Amtrak routes, Amtrak may not discontinue, reduce the frequency of, suspend, or substantially alter the route of rail service on any segment of any long-distance route in any fiscal year in which Amtrak receives adequate Federal funding for such route on the National Network." This is essentially the established policy, but a new provision, §22210(d), requires 210 days' notice to members of Congress who represent states or districts where the discontinuance would occur. Presumably this provision was added to prevent another sudden service reduction, like the cut in long-distance service to tri-weekly that began last October and lasted until the beginning of this past summer.

Section 22211 establishes new requirements and procedures for a State-Supported Route Committee. The provision concerns methodology for reports from the committee, efficiency, and evaluation of state payments to Amtrak for running state-supported trains. Amtrak must provide monthly invoices to the committee and the sponsoring states (§22211(b)(1)), consulting and cost-methodology requirements when establishing new state-supported routes (§22211(g)(1) and (2)), and updated cost methodologies (§22211(h)). Section 22112 concerns enhancing cross-border services into Canada, although it has not yet been determined when (or if) those trains will return to the rails. Section 22213 is titled "Creating Quality Jobs" and contains certain prohibitions on contracting work out, especially work that had been performed by a furloughed employee.

New Long-Distance Trains?



Section 22214 calls for a study to evaluate restoring daily intercity service along routes that were discontinued or ran on non-daily schedules, as of the date of enactment of this Act (§22214(a)(1) and (2)). The provision also sets out methodology for the study (§22214(b)), other factors to consider (§22214(c)), and requirements to consult with certain parties (§22214(d)). Significantly, §22214(d)(6) includes "nonprofit organizations representing Amtrak passengers" in the list of entities to be consulted. As noted in comments concerning food and beverage service, they include RUN and RPA.

It is also significant that the study, under the supervision of the Secretary of Transportation, can consider restoring service on routes that operated in April 1971, but not under Amtrak auspices since that time. The "other factors" to be considered under that section include: "taking into consideration whether those new routes would (1) link and serve large and small communities as part of a regional rail network; (2) advance the economic and social well-being of rural areas of the United States; (3) provide enhanced connectivity for the national long-distance passenger rail system; and (4) reflect public engagement and local and regional support for restored passenger rail service."

The new legislation does not expressly repeal the definition from PRIIA (41 U.S.C. §24102(5)(C)) that freezes the long-distance network, even though the above-quoted provision seems to be inconsistent with it. It appears that the two can only be harmonized if the mandated study is conducted, but all of its recommendations that call for restoring trains are ignored, since any new long-distance trains must be treated as state-supported trains for funding purposes; a condition that has never been met with full success for any new Amtrak service ever operated with state support. It remains to be seen whether or not any new long-distance routes will ever be established and operated.

There is also a troubling ambiguity in §22214(b)(5), which states that the study shall: "identify Federal and non-Federal funding sources required to restore or enhance the services described in paragraph (1), including (A) increased Federal funding based on applicable reduction or discontinuance in service; and (B) options for entering into public-private partnerships to restore that service." Part (B) may be inviting OTG's Silver Bullet technology and its PPP funding option for that service funding. This study, prepared by OTG for Amtrak's Northeast Corridor line, commencing new construction in 2022 is available for review.

While the private sector has not embraced experimentation as described in subsection (B), (This is not correct. See other sections marked with blue markings.) subsection (A) could pose a severe

problem: Would some or all of the Federal funding mentioned in the provision come from savings that result from discontinuing trains or reducing services in other ways? (such as introducing more-effective lower cost OTG Silver Bullet technology)

While that idea does not appear to fit into a statutory provision that expressed the intent of expanding and enhancing service, it nonetheless raises the possibility of implementing "applicable reduction or discontinuance in service" on some routes to help pay for service enhancements elsewhere. Unless that ambiguity is resolved in a manner that unequivocally affirms that no services or trains will be reduced or discontinued, no train that currently runs is completely safe for the five-year duration of the new statute, and the entire purpose of expanding the Amtrak national network will be thwarted. Again, the devil is in the details, and in the implementation, so time will tell what actually happens, despite purported legislative intent.

Other Intercity Passenger Rail Policies

Subtitle C covers these policies, starting with the Northeast Corridor, at §22301. Section 22301(a)(1) calls for a Northeast Corridor Service Development Plan, to be completed by March 31, 2022. (OTG would like to participate in that planning with its already-completed draft analysis of a business plan for a Silver Bullet line replacing the present NEC service with 220-mph service.) It will be prepared by the Northeast Corridor Commission, an existing organization whose members are the transportation commissioners of the states along the NEC (the head of NJ Transit occupies New Jersey's seat). It will provide a 15-year plan covering projects along the corridor, and identifying service objectives and capital investments required to meet them. There is also a requirement for annual capital investment plans with a five-year planning frontier. Section 22302 gives the Northeast Corridor Commission direction toward implementing these policies.

Section 22303 calls for consolidated rail infrastructure and safety improvements. Section 22304 authorizes restoration and enhancement grants on a more-generous formula than the one specified in the Passenger Rail Reform and Investment Act of 2015 (codified at 49 U.S.C. §22908(e)(3)). The old formula limited grants to 80% of the projected net operating costs for the first year of service, 60% for the second year, and 40% for the third year. The new formula extends the life of the grant to six years, with new amounts of 90% of the projected net operating costs for the first year, 80% for the second year, 70% for the third year, 60% for the fourth year, 50% for the fifth year, and 30% for the sixth year. This is an important change to assist in covering start-up costs and may be refundable from system operations.

Section 22305 specifies a railroad grade crossing elimination program, and §22306 deals with interstate rail compacts. One of the purposes of that provision is "promotion of intercity passenger rail operation" (§23306(a)(3)), but there is a limit of ten such grants of not more than $1 million each per year.

Section 22307 calls for a Federal-state partnership for intercity passenger rail grants. Categories for eligible capital projects include state of good repair, performance improvements and new services.

Section 22308 establishes a Corridor identification and development program by adding a new Chapter 251. The new chapter establishes eligibility, requirements and considerations for

establishing new corridors. It also specifies a process whereby eligible entities can submit proposals for starting such corridors, including service development and funding plans. An "intercity passenger rail corridor" is still defined as a route less than 750 miles long.

The Surface Transportation Board (STB) has recently become involved with some issues concerning passenger rail, notably, the effect of host railroads on Amtrak's on-time performance, and settling disputes between Amtrak and private sector railroads, including the initiative to start service between New Orleans and Mobile, Ala. Section 22309 is concerned with initiatives such as these.

Subtitle D, beginning a §22401, pertains to Rail Safety, and includes a number of provisions that set out technical rules and procedures for enhancing it. They pertain to grade crossings, lighting, a study to determine operation and maintenance costs for positive train control (PTC), a comprehensive safety review of Amtrak, crew training, hours of service, speed limits, freight cars, and several other topics.

At least one portion of the transit industry has expressed its concerns, and riders have reason to express their own, especially about Amtrak. In today's politically divided nation, the Biden Administration and Congressional Democrats probably did well to get as much as they got. Amtrak's supporters and transit advocates could probably have devised an alternate plan that would have served Amtrak and transit riders better, but the opposition to any sort of public transportation, especially from rural areas and other places that have little or none of it, remains strong and tenacious.

The package could have done more for riders if some provisions had been different, but that particular discussion and any potential suggestions for improvement lie beyond the purview of this article. Time will tell how much the provisions end up improving mobility overall, especially for persons who depend on transit. In the meantime, some money should soon be coming, which will keep Amtrak and transit alive. It will also spend a lot on highways, but that would have happened in any event.

About the Author: David Peter Alan is one of America's most experienced transit users and advocates, having ridden every rail transit line in the U.S., and most Canadian systems. He has also ridden the entire Amtrak network and most of the routes on VIA Rail. His advocacy on the national scene focuses on the Rail Users' Network (RUN), where he has been a Board member since 2005. Locally in New Jersey, he served as Chair of the Lackawanna Coalition for 21 years, and remains a member. He is also a member of NJ Transit's Senior Citizens and Disabled Residents Transportation Advisory Committee (SCDRTAC). When not writing or traveling, he practices law in the fields of Intellectual Property (Patents, Trademarks and Copyright) and business law. The opinions expressed here as published in Rail Group News are his own.

END OF INFRASTRUCTURE ANALYSIS

Appendices

*Appendices A., B. and R. are provided on a Memory Stick in Excel format as well as pdf. Appendices Calculations 1 and Calculations 2 are available on a Memory Stick in Excel format. All Appendices *.pdf are supplied separately on a Memory Stick if requested.*

Document and Appendices (A, B, C & D presented in memory stick)

A. OTG Submittal Document.pdf, including Description.pdf and Additional Funding Options Provided Nov. 15, 2021 under the "Infrastructure and Jobs Act", HB-3684, a review and simplified analysis published in Rail Group News.
B. PowerPoint A. - A Presentation of the Basics of the Atlanta Project as taken from Excel Workbooks P. Project and R. Ridership.
C. Excel Workbook P. - Project and Tables P1-P11.xlsx and .pdf
D. Excel Workbook R. - Ridership and Tables R1-R11.xlsx and .pdf
E. Specifications: (Restricted Trade Secrets, available upon request)

1. Specification C.pdf – Controls
2. Specification D.pdf – Drive Units
3. Specification F.pdf – Fare
4. Specification G.pdf – Guideway
5. Specification M.pdf – Project Management
6. Specification O.pdf – Operations
7. Specification P.pdf – Power Bars
8. Specification Q.pdf – Routes Planning
9. Specification R.pdf – Rails
10. Specification S.pdf – Stations
11. Specification V.pdf – Vehicles

F. Calculations: (Restricted Trade Secrets, available upon request)

Excel Workbook Calculations 1.xlsx (Restricted Trade Secrets, available upon request)
Excel Workbook Calculations 2.xlsx (Restricted Trade Secrets, available upon request)

PROCESS: FOR FAIR RECYCLING OF TAX COLLECTIONS TO ASSIST IN HIGHROAD TRANSIT CONSTRUCTION

A. Owen Transit Group, Inc. (OTG, technology and engineering provider) and Guideway Mobility Group, Inc. (GMG, builder and construction manager) present the HighRoad Regional Atlanta 372-mile heavy capacity elevated guideway rail project as an unsolicited proposal to the Federal Transit Administration, the Georgia ATL Authority, Atlanta regional governments, and related Georgia agencies. A Financing process offered by OTG is called "Tax Recycling". Similar project financing can be used for any transit system infrastructure that is estimated to operate to generate significant cash flow from operations, and where the ridership is adequate to justify the project. The system is to serve all counties according to the population of each.

B. Purpose of Tax Recycling: Large transportation infrastructure projects that serve the public of large city regions by their natures must be large. These projects are expensive and may have lifetimes spreading over decades. They also must be sustainable and not depend on huge grants from taxpayers and governments at all levels. Conventional commercial financing cannot be supported without recycling. And local citizens are reluctant to add taxation that will reduce their standards of living and reduce their economic well-being when it is not necessary.

C. History of Tax Recycling: Current Federal grant managers may already assume recapture of more than the amount of their grants, provided that the grants involve funding labor which is similarly taxed through several layers of economic activity. In this recycling, the economic activity is increased significantly by the added layers of taxation resulting from the added initial commercial activity, resulting in more government income with recycling than without. A bonus is that while desired infrastructure is added to the economy, the net cost to all layers is zero.

However, if the project is <u>not</u> built due to lack of this recycled tax capital and its attraction of added capital, three bad things will happen to transit - - -

1. Without the project other funds are unlikely to be available to design, build and operate it, and there may be <u>no modern Atlanta system</u>.

2. Without the project there may be no new construction and induced Georgia jobs for about 33,000 people expected each year for 12 years.

3. Without the project, the City, County, State and Federal revenue offices may not get the business growth taxes expected from the system.

So, without the project and its recycling taxes plan approved by Georgia and the FTA, the region needlessly will lose a transit system, its jobs and its future added taxes from growth.

Net recycled cash flow is neutral and everyone gains. Only recycled taxes are collected from the project; being immediately replaced in the state and federal treasuries.

The OTG plan for recycling uses anticipated project tax income to start the construction process. When operations begin to provide income from the carriage of passengers (operation) that income will add to other funding sources for the rest of the construction and through retirement of construction bonds. Both State and Federal specified existing taxes are to be recycled repeatedly, and the project can be built without new taxes. The internal process is for the taxes collected from the process (or estimated taxes) by the Government to be immediately forwarded to the State and Federal agencies that issue the funds each month to the project.

This recycling provides large amounts of money to the project yet costs the governments nothing since without the recycling the project would not be built. In addition, the governments gain since the project increases net wealth of the region and improves citizens' lives through the creation of a vital transportation system. Further, the governments gain since less road-building needed reduces the costs of taxation needed to build and maintain the roads.

Good News! Since the recycling is just a monthly short-term grant repaid immediately from Georgia taxes resulting from the project, it amounts to only a $11.043 million one-time loan from Georgia taxes, and a $21.561 million one-time loan from Federal taxes (both repeating monthly, both repaid monthly). Both are collected from project-created taxes* on work *during the next month! Net state and Federal cost to build is $ ZERO since each month of collections quickly repays the one-month loan, and the same money can be recycled through construction until the project is finished and the final short-term loan repaid! And after the project is built, it provides more taxes to both State and Federal treasuries while providing annual income to local counties and the host state. Interest on the 30-day loans is more than offset by gains to Employer/Employee payroll taxes.

D. Estimated available cash for Atlanta 343-mile elevated heavy-capacity rail system:

$ 2.216 Billion from Georgia, recycled over the next month (repeating) from sales and income taxes generated by the project.
$ 4.140 Billion from the Federal Government, recycled the next month (repeating) from income taxes generated by the project.
$ 1.380 Billion from a P3 contractor, provided from contractor profits and paid into the construction of the project.

$ 10.664 Billion from bonds repaid paid from operations net during the operating years.

$ 18.400 Billion is the total money available for the project with no new taxes and no bonds needed. (All cash flows and costs are based on 2021 dollars, December 2021 estimate.)

When successfully completed and in successful operation, then an estimated $76,947,000 annual net would be retained by the operator, continuing to be at risk during years of maximum bond repayments.

END OF SUBMITTAL

Submitted by Owen Transit Group, Inc.
William E. Owen, P.E., President
481 S. Keeler Woods Drive, Marietta, GA 30064
Telephone: 404-683-1331
Email: billowen@OTG-Inc.com