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M E M O R A N D U M

To: John Orr, Atlanta Regional Commission

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From: Gil Grodzinsky

Subject: GA EPD TCM Removal SIP Revision

Transportation Control Measures (TCMs) are transportation projects or programs codified into federal law through inclusion in Georgia's State Implementation Plan (SIP). ARC tracks the implementation of these projects through the Conformity Determination Report associated with regional transportation plan updates. A complete list of currently codified TCMs is included as Table 1 of this memo. TCMs in the Atlanta SIP cover the gamut of transportation improvements from transit enhancements and commuter incentives to the HOV system and bridges associated with the Atlantic Station redevelopment.

Many TCMs were included in the SIP during the period of the middle 1990s to help advance attainment of the 1-hour ozone nonattainment area. In these cases, the State took off-travel model credit for their implementation in the SIP directly. Later in the 1990s and early 2000s, during the conformity lapse, several TCMs were added to allow for the continued advancement of certain key infrastructure project in a period when all non-exempt projects were frozen. Outside of these periods, no TCMs have been added to the Atlanta nonattainment area's transportation program.

TCMs inserted in the State's SIP do not have a sunset, unless specifically mentioned. Many are outdated, with new technologies or programs being implemented. In some cases, TCMs have affected land use decisions and can prevent the implementation of newer best practices in travel demand management or transit operations. Many TCMs have outlived their useful life and are due to be retired. Therefore, GA EPD has requested that TCMs in the SIP be removed except for Intersection Upgrade and Computerization.

According to Clean Air Act Section 110(l), GA EPD when removing emission control strategies like TCMs from the SIP needs to demonstrate non-interference of this action on the area's ability to achieve attainment in a timely manner and to maintain attainment in areas that are in attainment of NAAQS standards. Below briefly describes the methodology and results from this

non-interference test which justifies GA EPD's ability to remove TCMs for the SIP with the exception Intersection Upgrade and Computerization.

ARC staff with GA EPD reviewed the methodologies and tools used to prepare the original TCM emission reports from the mid to late 1990s justifying their inclusion in the SIP and used the following methods (Tables 2 and 3) to assess the emission impacts removing each TCM would have on the region's air quality. GA EPD and ARC staff worked with new and updated assumptions, tools and methodologies, where appropriate, to assess the impact the TCMs have on regional emissions. These assumptions would always err on the maximum impact to provide a conservative evaluation, further assuring non-interference.

The TCM calculations fell in two broad methodological categories: Activity-Based Model Travel Demand Model (TDM) projects (Table 2) and off-model projects (Table 3).

Those projects evaluated through the TDM were coded and run through in one system-wide run. The resulting travel networks were carried through full MOVES (emission model for mobile sources) emission runs, similar to a conformity determination analysis run, to determine the amount of emission increase in ozone precursors (nitrogen oxides (NOx) and volatile organic compounds (VOCs)) resulting from removal of TCMs in the TDM. The TDM method was preferred and all eligible projects were evaluated using this methodology.

Projects evaluated using off-model methods cannot be run through the TDM. These projects rely on updated methodologies based off those used in the 1990s. ARC staff worked with GA EPD in updating inputs and assumptions, as applicable, to bring these techniques into the 21st century. The methodologies focused on vehicle mile traveled (VMT) calculations to apply set MOVES-based emission factors in determining the amount of emission increase in ozone precursors resulting from the TCM removal.

Lastly, GA EPD was able to identify contemporaneous, permanent, quantifiable, enforceable, and surplus projects in the area that reduced emissions of NOx at an equivalent level that offset any emission increases from TCMs minus the Intersection Upgrade and Computerization. The locomotive and bus replacements are detailed in Attachment A.

With the emissions impact calculated for all the TCMs, three issues were addressed to complete the demonstration of non-interference with the ozone NAAQS and justify their removal (with exception of Intersection Upgrade and Computerization):

A. Impact on 2008 Ozone NAAQS Maintenance Plan for 15 county Atlanta maintenance area (Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, and Rockdale): Ran MOVES with and without TCMs in the Travel Demand Model grid and compared. No off-model TCMs evaluated since the Motor Vehicle Emissions Budgets (MVEBs, including safety margins allowing for uncertainty in planning assumptions and models over time) did not take any of them into account. Result: No change to maintenance plan required. A slight decrease in emissions of NOx (-0.027 tons/day) and tiny increase in VOCs (0.008 tons/day) is observed. Neither changed the MVEBs since not adjusting for a slight decrease in NOx is

conservative, and the tiny decrease in VOCs did not change any numbers within 0.01 of a ton, which is the precision used with MVEBs.

B. Transportation Conformity Regional Emissions Analysis Impacts: All TCMs taken into account since this analysis is used for both the 15 county 2008 Ozone NAAQS Atlanta maintenance area and the 7 county 2015 Ozone NAAQS Atlanta nonattainment area (Bartow, Clayton, Cobb, DeKalb, Fulton, Gwinnett, and Henry counties). Result: No adverse impact on conformity. Figures 1 and 2 illustrate how the emissions evaluated for 2020, 2030, and 2040 are well below the budgets (dashed blue line and solid green lines) with the curves for emissions with and without TCMs indistinguishable from each other.
C. Emission offsets to account for any emissions increases from TCM removal as required for the 2015 Ozone NAAQS nonattainment area: All TCMs included in assessing emission impacts. Compared with equivalent emission decreases available through locomotive and school bus replacement programs. Result: 85.36 tons/year NOx emission increase with removing all TCMs (assuming 245 day ozone season) versus available offset of 38.85 tons/day NOx, not enough. However, keeping the Intersection Upgrade and Computerization TCM reduced the emissions impact to 31.19 tons/per day, easily offset by 38.85 tons/day. Attachment B provides more details on this calculation.

With the above results plus non-interference with other NAAQS, GA EPD demonstrated that all TCMs except Intersection Upgrade and Computerization can be removed while fulfilling the requirements of Clean Air Act 110(l). In terms of how it affects your MPO:

1) **This action will not degrade the air quality in the region.** Even if all the TCMs were removed in 2020, any slight emissions increase would be erased by equivalent decreases in emissions from new locomotive and bus replacement projects.
2) **No further action will need to be taken by the MPO.** GA EPD is responsible for the SIP revision submission and associated requirements. GA EPD is just, as required by the transportation conformity rule, informing all stakeholders including MPOs of any actions done on the SIP that are relevant to transportation conformity, air quality, and planning in the area. GA EPD is here to answer any questions about this action.
3) **This action has no impact on projects in the TIP/RTP.** They remain as is. The listed projects in Table 1 will no longer be in the Georgia SIP and be treated like all other projects.

GA EPD began a 30 day comment period on June 29, 2019 including submission of a final draft to the EPA for their review. After 30 days there will be a public hearing at the Tradeport Office at 4244 International Parkway, Atlanta, GA 30354 with a deadline for any additional comments on August 5, 2019. Once the comment period ends, any comments will be addressed, and then a final submission of this SIP revision will be made to the EPA. After publication in the Federal Register (how long this takes varies) as a proposed rule and any comments addressed, a final rule will then be published, effective shortly thereafter (typically 30 days). At this point, the TCMs will be removed from the SIP, except for Intersection Upgrade and Computerization. Any modeling files, detailed calculations and methodologies are available for review upon request with the pre-hearing SIP revision available during the 30 day comment period on GA EPD's Air Protection Branch website (https://epd.georgia.gov/proposed-rules).

Table 1. Status of Atlanta SIP TCMs

Description	ARC Project #	GDOT PI #	TIP	Status
HOV LANES Sponsor – GDOT I-85N from Chamblee-Tucker Rd to SR 316 (HOT Lanes), I-85 @ SR 316, Interchange Reconstruction	AR 073B	713760	98-00, 99-01	Implemented
	GW-AR 053A GW-AR 053B	110530	01-03 02-04 03-05 05-10	Implemented Implemented
ALTERNATIVE FUEL STATION Sponsor – Douglas County	DO-AR 211	771035	98-00 99-01 00-02 01-03 02-04	TCM removed from SIP on 11/28/2006 (71 FR 68740, November 28, 2006)
ATLANTIC STATION, 17th STREET BRIDGE Sponsor – City of Atlanta A – Bridge and Southbound off ramps C – Northside Dr over Norfolk Southern Railroad to Atlantic Station D – Northbound off ramp to 17th Street Bridge, Williams St Relocation	AT-AR 224A AT-AR 224C AT-AR 224D	714190 0001297 0001298	00-02 01-03 02-04 03-05 05-10	A – Implemented C – Implemented D – Implemented
CLEAN FUEL BUSES Sponsors – MARTA and CCT	M-AR 232	N/A	94-95	Implemented
EXPRESS BUS ROUTES Sponsor – MARTA	M-R 160 M-R 162	770632 770632	94-96	Implemented
IMPROVE / EXPAND BUS SERVICE Sponsor – MARTA	M-R 161	770633	96-98	Implemented
INTERSECTION UPGRADE, COORDINATION & COMPUTERIZATION Sponsor(s) – GDOT in partnership with local Jurisdictions	AT 089	04Y108	93-95	Implemented
	CL 094	770600	94-96	Implemented
	CO 249	770601	94-96	Implemented
	DK 118	770603	94-96	Implemented
	FN 086	770605	94-96	Implemented
	FS 068	770605	94-96	Implemented
	GW 135	170950	94-96	Implemented
	R 098	04418	93-95	Implemented
	R 098	770391	94-96	Implemented
ITS – ADVANCED TRAFFIC MANAGEMENT SYSTEM / INCIDENT MANAGEMENT PROGRAM Sponsor – GDOT	R 098	770391	94-96	Implemented

Description	ARC Project #	GDOT PI #	TIP	Status
I-75/I-85 within I-285, Northern portion of I-285 between I-75 and I-85				
CLEAN FUELS REVOLVING LOAN PROGRAM Sponsor – GEFA	R 195	770790, 770795	96-98	Implemented
HOV LANES Sponsor – GDOT I-75 and I-85 within I-285	R 174	320H94	94-96	Implemented
PARK & RIDE LOTS Sponsor(s) – Douglas & Rockdale Counties Douglas County – Chapel Hill @ I-20, Rockdale County – Sigman @ I-20	DO 211C		94-96	Implemented
REGIONAL COMMUTE OPTIONS & HOV MARKETING PROGRAMS Sponsor(s) – GDOT	R 159	770631	94-96	Implemented
SIGNAL PREEMPTION Sponsor – MARTA	M-R 164	770636	94-96	Implemented
TRANSIT INCENTIVES PROGRAM Sponsor - MARTA	M-AR 231A M-AR 231B	771031 771119	98-00 99-01 00-02	Implemented
TRANSPORTATION MANAGEMENT ASSOCIATIONS Sponsor – ARC	AR 221A AR 221B AR 221C AR 221E AR 221F	771033 771140 771141 0000570 0000571	98-00 99-01 00-02 01-03	Implemented
UNIVERSITY RIDESHARE PROGRAM Sponsor - ARC	AR 220A AR 220B AR 220C AR 220D AR 200E	771032 771113 0000351 0000567 0000568	98-00 99-01 00-02 01-03 02-04	Implemented

Table 2. ABM-Based TCM Emission Offset Methodology

TCM Name	TCM Description	Brief Methodology Description
HOV Lanes	I-75 & I-85 ITP HOV lanes	Convert the HOV lanes to GP lanes in the model
HOT Lanes	I-85 HOT lanes	Convert the HOT lanes to GP lanes in the model
Atlantic Station	17th St bridge & ramps 17th St bridge over rail	Remove the bridges, ramps and transit
Express Bus Routes	#5, #6, #36, #125, XPPRESS #428 & #426	Remove the transit routes from the model
Improve/Expand Bus Service	#15, #114, #111	Remove the transit routes from the model
Park & Ride Lots	West Douglas P&R Sigman Rd @I-20	Remove the transit stops & associated routes from the model
Transit Signal Preemption	MARTA Routes #15 and #39	Remove the benefit of TSP from the model

Table 3. Off-Model-Based TCM Emission Offset Methodologies

TCM Name	TCM Description	Brief Methodology Description
Clean Fuel Buses	200 CNG buses for MARTA & CCT	Prepare emission comparison for 200 CNG & diesel buses
Clean Fuels Revolving Loan Program	1,800 vehicle revolving clean fuel program	The emissions benefits of this TCM have phased out as Tier II and Tier III emissions standards and fuels have replaced Tier I and clean fuel fleet (CFFV) standards
Intersection Upgrade, Coordination & Computerization	Upgrades to 1,708 signals in Clayton, Cobb, DeKalb, Fulton and Gwinnett counties	Copy method used in 1990s with updates to planning assumptions
ATMS/Incident Management	I-75 & I-85 ITP & I-285 northern perimeter	Copy method used in 1990s with updates to planning assumptions
Regional Commute Options & HOV Marketing	Marketing and incentives to carpool & use transit	Copy method used in 1990s with updates to planning assumptions
Transit Incentives	Transit subsidies to employees in TMAs	Copy method used in 1990s with updates to planning assumptions
Transportation Management Associations (TMAs)	Formation and programs run by TMAs to encourage mode split	Copy method used in 1990s with updates to planning assumptions
University Rideshare Program	Carpooling and transit incentives program for university students/staff	Copy method used in 1990s with updates to planning assumptions

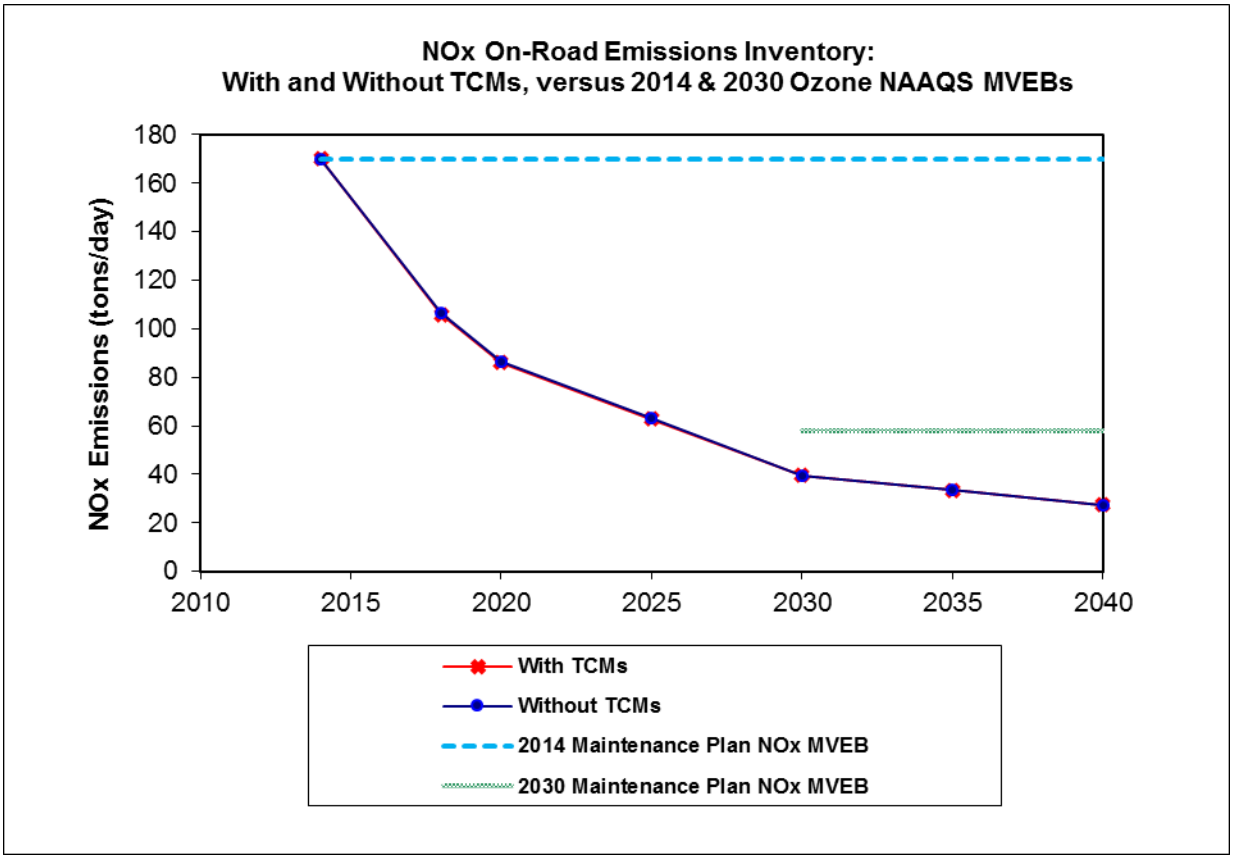

Figure 1. Impact of TCMs on NOx Emissions and Comparison with MVEBs

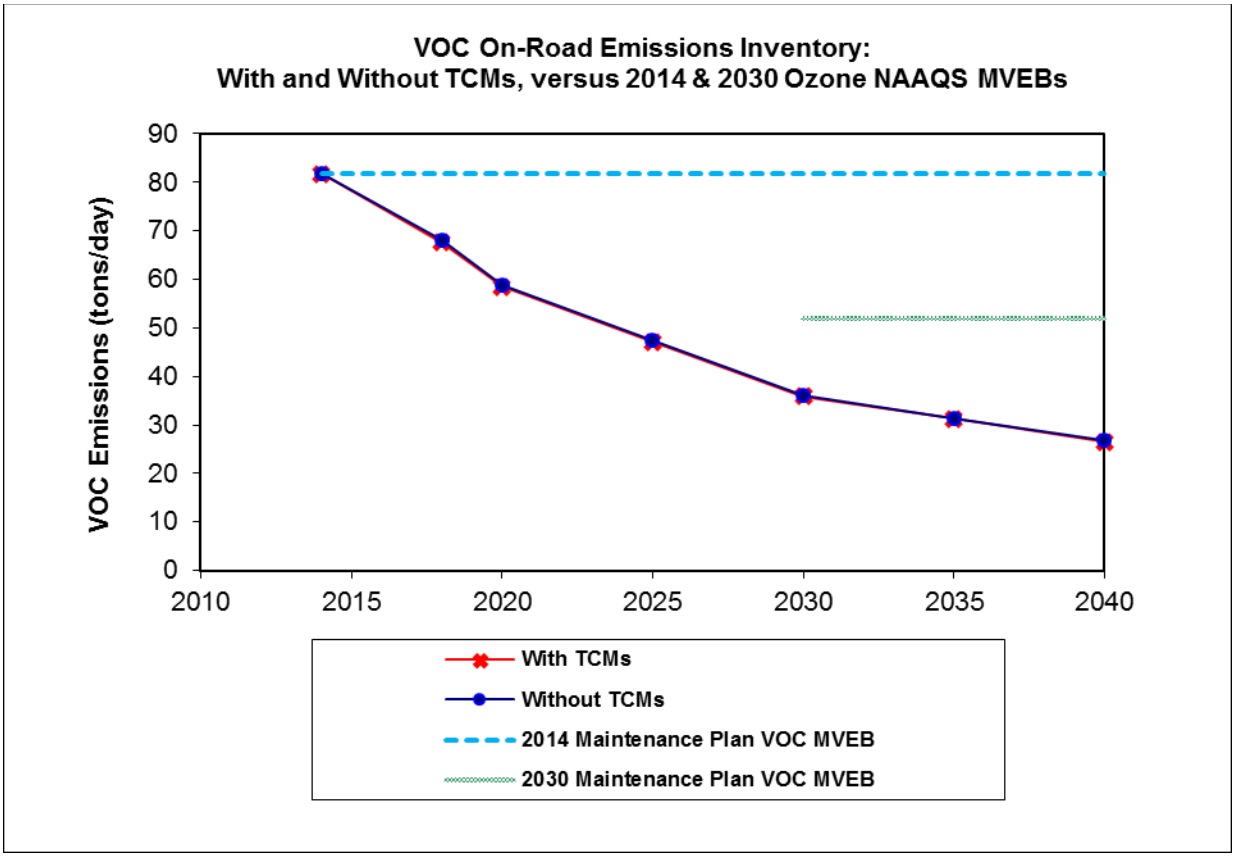

Figure 2. Impact of TCMs on VOC Emissions and Comparison with MVEBs

ATTACHMENT A: PROJECTS OFFSETTING TCM EMISSION INCREASES

Locomotive Offsets

Georgia EPD has worked with the railroad industry to replace higher-emitting, existing diesel locomotive engines with lower emitting locomotive engines. As such, the Georgia Department of Natural Resources has entered into a contract with the Norfolk Southern Railway Company to complete locomotive engine modifications that will reduce NOX emissions in the nonattainment area. In total, these locomotive conversions will reduce NOX emissions by 25.99 tons per year for 10 years or longer. The project is funded through the U.S. DOT Federal Highway Administration's Congestion Mitigation and Air Quality (CMAQ) Program through a memorandum of understanding between the Georgia Department of Transportation and Georgia EPD.

The majority of switcher locomotives in use across the country today are old (TIER 0 or Unregulated) with high emissions of PM, NOx, and VOCs. These older, switcher locomotives will typically remain in service for an extensive time (in excess of 50 years) because of the high capital cost of new locomotives. While the contract only requires a ten-year commitment, this project should have long-lasting air quality benefits for the region. This particular CMAQ project involves Norfolk Southern Railway. Norfolk Southern Railway, Inc. converted five older TIER 0 or lower original locomotives to five clean "mother" locomotives meeting the EPA TIER 3 Line Haul Duty Standard and EPA TIER 2 Switcher Duty Cycle Standard or better.

School Bus Replacement Offsets

Georgia EPD has a strong school bus early replacement program. School bus replacement projects completed in 2018 using DERA funding have resulted in NO_X emission reductions of 12.86 tons per year in the Atlanta metro nonattainment area. Specifically, eighty-five old (model year 1999-2005) school buses in Fulton County were replaced with 2018 school buses.

Total Offsets: 25.99 tons/year (locomotives) + 12.86 tons/year (bus) = 38.85 tons/year NOx reductions.

These offsets were verified with EPA to be contemporaneous (occurring at about the same time as the emission increases from TCMs), permanent (the emission reductions will not change for at least 10 years), surplus (not already credited in the SIP or part of any other requirements), enforceable (can be monitored and verified), and quantifiable. Therefore, they can be applied against the emission increases from TCM removal.

ATTACHMENT B: OFFSET DEMONSTRATION BASIC CALCULATIONS

1. All TCMs removed: 0.32 tons/day NOx increase, 0.49 tons/day VOC increase (calculations of impact of each individual off-model TCM and combined TDM TCMs available upon request and provided to Atlanta Interagency members)
2. Offsets are per year, convert to tons/year by multiplying these values by 245 (days of ozone season)
3. 0.32 tons/day NOx x 245 = 79.06 tons/year NOx, 0.49 tons/day VOC x 245=121.01 tons/year VOC
4. Offsets are for NOx, so convert VOC emission increase that needs an offset into "equivalent" NOx increase
5. Air quality model sensitivity analysis indicates Atlanta area ozone 18.3 times more sensitive to NOx to VOC, so divide VOC impact by 18.3 (simplified to nearest tenth for explanatory purposes)
6. Total NOx impact= 79.06 tons/year + 121.01/18.3 = 79.06 tons/year + 6.62 tons/year=85.68 tons/year NOx offset needed
7. Offsets available: Locomotive replacement (Tier 0 or uncontrolled switcher locomotive replaced with clean, new Tier 3 engine (mother) and engineless concrete filled car (slug)) and old school bus replacement
8. Locomotive replacement reduction: 25.99 tons/year NOx, School bus replacement reduction: 12.86 tons/year NOx, Total=38.85 tons/year NOx
9. 85.36 tons/year needed>38.85 tons/year NOx available offsets, not enough.
10. If keep Intersection Upgrade and Computerization TCM, reduces to 0.11 tons/day NOx increase, 0.30 tons/day VOC increase.
11. 0.11 tons/day NOx x 245 = 27.93 tons/year NOx, 0.30 tons/day VOC x 245 = 74.30 tons/year VOC
12. Total NOx impact= 27.93 tons/year NOx + 74.30/18.3 = 31.19 tons/year NOx
13. 31.19 tons/year needed<38.85 tons/year NOx available offsets, enough available!