

ARC's 2013 CMAQ Project Call

Framework, Tools & Lessons Learned

David D'Onofrio

Principal Planner – Air Quality & Climate Change

Atlanta Regional Commission

ddonofrio@atlantaregional.com

404-463-3268

Outline

- ARC's 2013 CMAQ Project Call Framework
- CMAQ Emissions Calculator
- Project Evaluation & Ranking
- Lessons Learned
- Interaction with State for CMAQ Process

CMAQ Project Call Framework

Letter of Interest / Eligibility
Determination

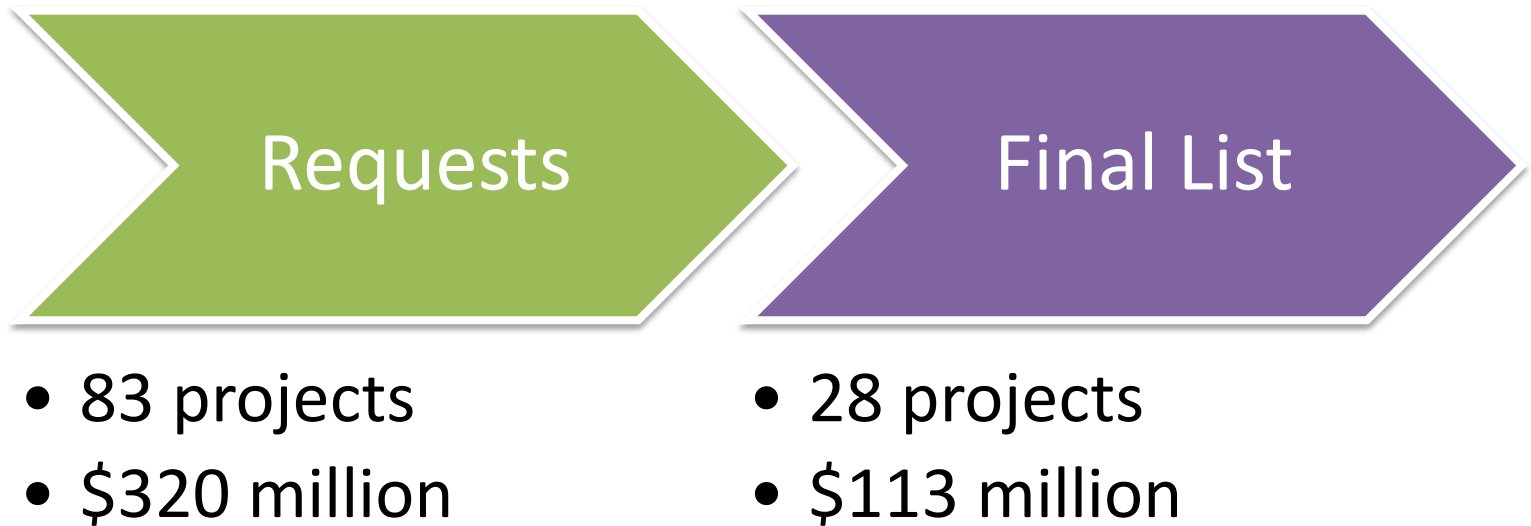
Technical Evaluation

Short-listing

Deliverability Assessment

Recommendations

CMAQ Project Call Framework



CMAQ Emissions Calculator

New Transit

Bicycle-
Pedestrian

Retrofits

Alt. Fuel
Vehicles

Signal Synch.

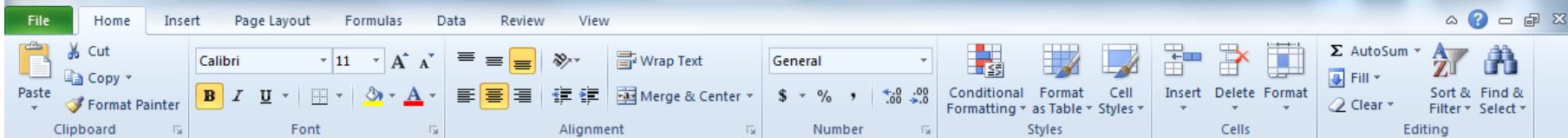
Intersection
Improvements

Roundabouts

Diverging
Diamonds

Managed
Lanes

Incident
Management



| Signal Synchronization | | | | | | |
|---|------------------------|-----------|-----------|---------------------------|-----------|-----------|
| | Morning Peak - Inbound | | | Afternoon Peak - Outbound | | |
| | 2010 | 2020 | 2017 | 2010 | 2020 | 2017 |
| Scenario Year | | | | | | |
| Calculation Inputs | | | | | | |
| Length of the signalized corridor (miles) | 1 | 1 | 1 | 1 | 1 | 1 |
| Existing Number of Signalized Intersections | 2 | 2 | 2 | 2 | 2 | 2 |
| Existing Number of Lanes (one direction) | 1 | 1 | 1 | 1 | 1 | 1 |
| Average hourly volume during peak period (one direction) | 470 | 470 | 470 | 660 | 660 | 660 |
| Truck Percentage (one direction) | 9% | 9% | 9% | 9% | 9% | 9% |
| Average corridor travel time (one direction) during peak period (minutes) | 2.03 | 2.03 | | 2.03 | 2.03 | |
| Existing Average Cycle Length (seconds) | 130 | 130 | 130 | 130 | 130 | 130 |
| Constants | | | | | | |
| Hours in Peak Period | 4 | 4 | 4 | 4 | 4 | 4 |
| Number of weekdays per year | 250 | 250 | 250 | 250 | 250 | 250 |
| Scenario Year Outputs | | | | | | |
| Travel Time Savings (min) | 0.28 | 0.28 | 0.28 | 0.30 | 0.30 | 0.30 |
| Travel Time after Improvements | 1.75 | 1.75 | | 1.73 | 1.73 | |
| Auto VMT (one direction) | 556 | 556 | 556 | 781 | 781 | 781 |
| Truck VMT (one direction) | 55 | 55 | 55 | 77 | 77 | 77 |
| Existing Avg Speed (mph) | 38.4 | 38.4 | | 38.4 | 38.4 | |
| Improved Avg Speed (mph) | 44.6 | 44.6 | | 45.0 | 45.0 | |
| Emission Factors - Existing | | | | | | |
| Light Duty Emission Factor CO2(g/mi) | 384.382 | 328.842 | 345.504 | 384.382 | 328.842 | 345.504 |
| Light Duty Emission Factor PM NOx(g/mi) | 0.646 | 0.210 | 0.341 | 0.646 | 0.210 | 0.341 |
| Light Duty Emission Factor PM (g/mi) | 0.016 | 0.011 | 0.013 | 0.016 | 0.011 | 0.013 |
| Light Duty Emission Factor NOx (g/mi) | 0.612 | 0.201 | 0.324 | 0.612 | 0.201 | 0.324 |
| Light Duty Emission Factor VOC (g/mi) | 0.227 | 0.072 | 0.118 | 0.227 | 0.072 | 0.118 |
| All Trucks Emission Factor CO2(g/mi) | 1,529.012 | 1,523.989 | 1,525.496 | 1,529.012 | 1,523.989 | 1,525.496 |
| All Trucks Emission Factor PM NOx(g/mi) | 8.074 | 2.329 | 4.053 | 8.074 | 2.329 | 4.053 |
| All Trucks Emission Factor PM (g/mi) | 0.415 | 0.096 | 0.191 | 0.415 | 0.096 | 0.191 |
| All Trucks Emission Factor NOx (g/mi) | 7.026 | 2.012 | 3.516 | 7.026 | 2.012 | 3.516 |
| All Trucks Emission Factor VOC (g/mi) | 0.577 | 0.221 | 0.328 | 0.577 | 0.221 | 0.328 |

Note: assume de

Note: assume de

Based on Califor

Lookup formula:
(MOVES Road Ty
of H) if you wantLookup formula:
5). Change Look
rural unrestrict

File Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Calibri 11 A A

B I U

Wrap Text

General

\$ % .00 .00

Conditional Formatting Format as Table Cell Styles

Insert Delete Format

AutoSum Fill Clear Sort & Filter Find & Select

| A61 | Light Duty Emissions NOx (g/mi) | | | | | |
|--|---------------------------------|---------------|---------------|---------------|---------------|---------------|
| A | B | C | D | E | F | G |
| 48 Light Duty Emissions PM NOx(g/mi) | 359,224.6 | 116,596.0 | 189,384.6 | 504,443.0 | 163,730.6 | 265,944.3 |
| 49 Light Duty Emissions PM (g/mi) | 9,085.2 | 6,151.9 | 7,031.9 | 12,758.0 | 8,638.9 | 9,874.6 |
| 50 Light Duty Emissions NOx (g/mi) | 340,033.0 | 111,776.2 | 180,253.2 | 477,493.1 | 156,962.3 | 253,121.6 |
| 51 Light Duty Emissions VOC (g/mi) | 126,393.3 | 39,827.1 | 65,796.9 | 177,488.4 | 55,927.4 | 92,395.7 |
| 52 All Trucks Emissions CO2(g/mi) | 84,080,392.3 | 83,804,144.4 | 83,887,018.8 | 118,070,338.1 | 117,682,415.6 | 117,798,792.4 |
| 53 All Trucks Emissions PM NOx(g/mi) | 443,992.2 | 128,086.0 | 222,857.9 | 623,478.4 | 179,865.5 | 312,949.3 |
| 54 All Trucks Emissions PM (g/mi) | 22,798.6 | 5,258.8 | 10,520.7 | 32,015.1 | 7,384.7 | 14,773.8 |
| 55 All Trucks Emissions NOx (g/mi) | 386,334.6 | 110,639.8 | 193,348.2 | 542,512.5 | 155,366.5 | 271,510.3 |
| 56 All Trucks Emissions VOC (g/mi) | 31,730.4 | 12,146.3 | 18,021.5 | 44,557.6 | 17,056.5 | 25,306.8 |
| 57 Annual Emissions- Improved | | | | | | |
| 58 Light Duty Emissions CO2(g/mi) | 205,880,657.5 | 176,339,619.9 | 185,201,931.1 | 288,366,252.5 | 247,008,861.4 | 259,416,078.8 |
| 59 Light Duty Emissions PM NOx(g/mi) | 355,707.1 | 116,757.8 | 188,442.6 | 499,355.5 | 164,031.5 | 264,628.7 |
| 60 Light Duty Emissions PM (g/mi) | 8,030.0 | 5,224.7 | 6,066.2 | 11,174.4 | 7,247.5 | 8,425.6 |
| 61 Light Duty Emissions NOx (g/mi) | 329,763.8 | 109,537.0 | 175,605.0 | 462,496.2 | 153,736.8 | 246,364.6 |
| 62 Light Duty Emissions VOC (g/mi) | 112,945.5 | 35,218.1 | 58,536.3 | 157,316.6 | 49,019.9 | 81,508.9 |
| 63 All Trucks Emissions CO2(g/mi) | 80,993,567.8 | 80,697,742.3 | 80,786,490.0 | 113,404,763.2 | 112,987,513.1 | 113,112,688.1 |
| 64 All Trucks Emissions PM NOx(g/mi) | 425,988.1 | 123,106.4 | 213,970.9 | 596,354.7 | 172,370.1 | 299,565.5 |
| 65 All Trucks Emissions PM (g/mi) | 20,861.9 | 4,607.5 | 9,483.8 | 29,090.4 | 6,403.9 | 13,209.9 |
| 66 All Trucks Emissions NOx (g/mi) | 370,566.5 | 106,257.7 | 185,550.4 | 518,757.3 | 148,770.5 | 259,766.6 |
| 67 All Trucks Emissions VOC (g/mi) | 28,374.5 | 10,568.0 | 15,909.9 | 39,515.5 | 14,684.5 | 22,133.8 |
| 68 | | | | | | |
| 69 Reduction in Annual Vehicle Hours of Delay | 2,196.1 | 2,196.1 | 2,196.1 | 3,283.2 | 3,283.2 | 3,283.2 |
| 70 | | | | | | |
| 71 Reduction in Annual Vehicle Hours of Delay | 5,479 | 5,479 | 5,479 | | | |
| 72 | | | | | | |
| 73 Total Annual Reductions in GHG emissions (g CO2 eq) | 27,342,920 | 24,045,451 | 25,034,691 | | | |
| 74 Total Annual Reductions in PM NOx Emissions (g) | 53,733 | 12,012 | 24,528 | | | |
| 75 Total Annual Reductions in PM Emissions (g) | 7,500 | 3,951 | 5,016 | | | |
| 76 Total Annual Reductions in NOx Emissions (g) | 64,789 | 16,443 | 30,947 | | | |
| 77 Total Annual Reductions in VOC Emissions (g) | 42,018 | 15,467 | 23,432 | | | |
| 78 | | | | | | |
| 79 | | | | | | |
| 80 | | | | | | |
| 81 | | | | | | |
| 82 | | | | | | |
| 83 | | | | | | |
| 84 | | | | | | |
| 85 | | | | | | |
| 86 | | | | | | |
| 87 | | | | | | |

CMAQ Emissions Calculator

local relevance

+

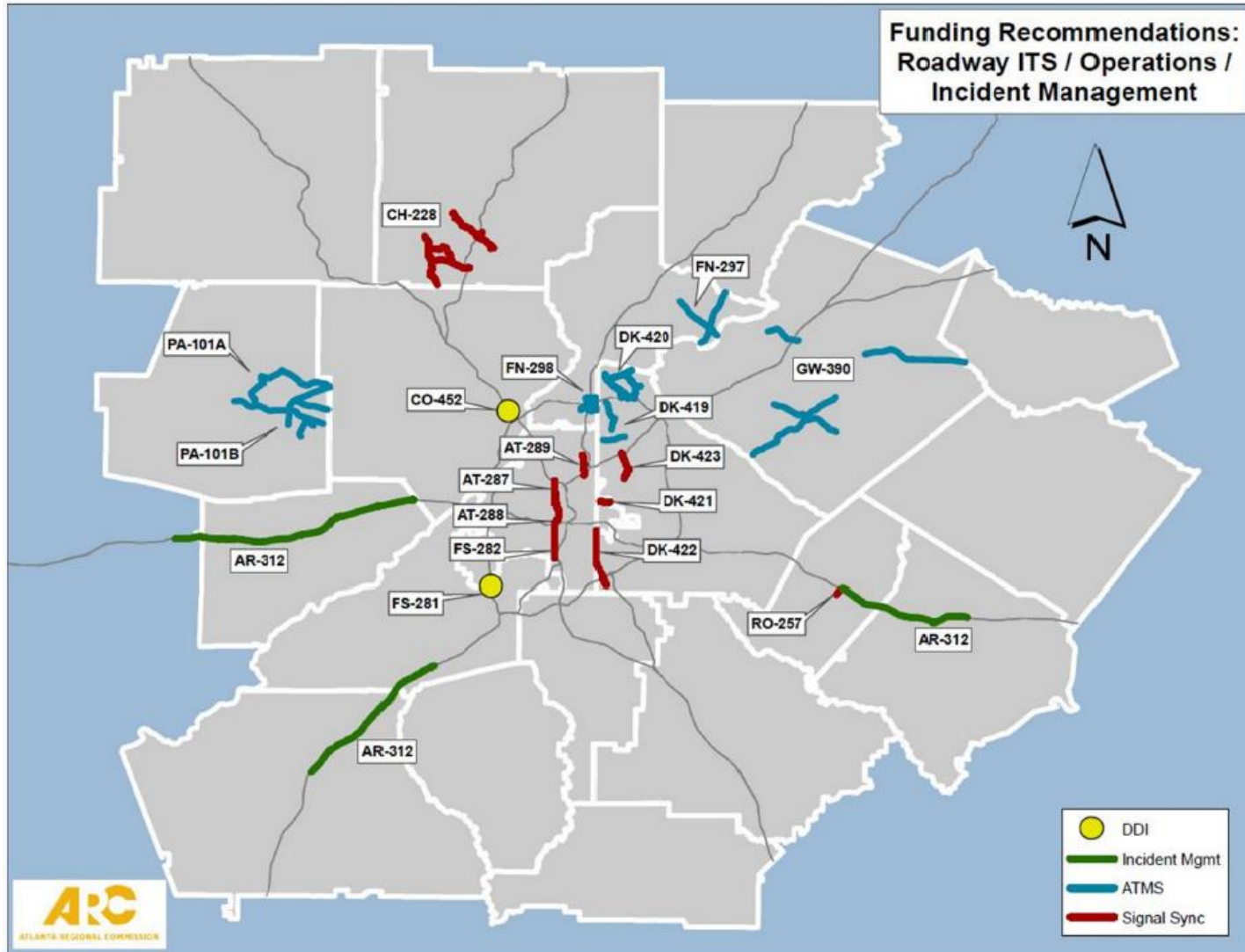
regional impact

| | | | |
|---|------------|------------|------------|
| Reduction in Annual Vehicle Hours of Delay | 5,479 | 5,479 | 5,479 |
| | | | |
| Total Annual Reductions in GHG emissions (g CO2 eq) | 27,342,920 | 24,045,451 | 25,034,691 |
| Total Annual Reductions in PM NOx Emissions (g) | 53,733 | 12,012 | 24,528 |
| Total Annual Reductions in PM Emissions (g) | 7,500 | 3,951 | 5,016 |
| Total Annual Reductions in NOx Emissions (g) | 64,789 | 16,443 | 30,947 |
| Total Annual Reductions in VOC Emissions (g) | 42,018 | 15,467 | 23,432 |

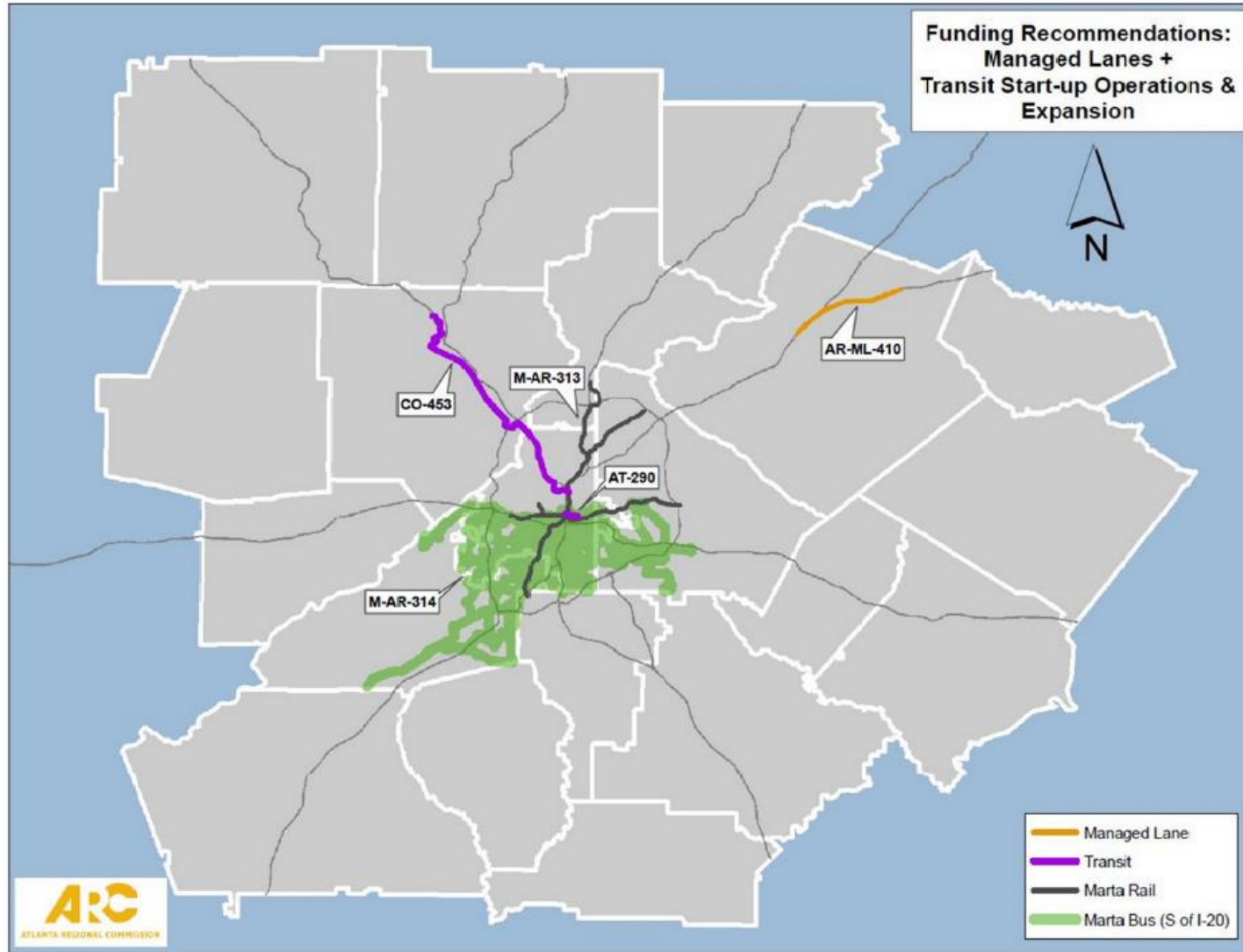
Project Evaluation and Ranking

| Project Type | Amount Awarded | Congestion | Air Quality | | | Impact |
|-----------------------|----------------|-------------------------|-----------------------|-----------------------|-------------------------|-----------------------------|
| | | Hours of Delay (Annual) | GHG Emissions (g CO2) | Nox Emissions (Grams) | PM2.5 Emissions (Grams) | Pop + Empl in 1/4 Mi Radius |
| ATMS | \$900,000 | 77,499 | 118,096,395 | 213,243 | 10,716 | 11,822 |
| ATMS | \$900,000 | 173,693 | 221,073,346 | 410,380 | 20,594 | 20,778 |
| ATMS | \$4,674,000 | 667,862 | 724,938,493 | 453,258 | 184,680 | 31,386 |
| ATMS | \$800,000 | 253,688 | 634,474,306 | 1,207,518 | 78,656 | 18,869 |
| ATMS | \$1,297,000 | 206,979 | 176,397,650 | 314,703 | 35,285 | 9,381 |
| ATMS | \$1,012,000 | 186,217 | 108,594,796 | 195,881 | 20,314 | 14,866 |
| ATMS | \$1,020,000 | 200,914 | 176,106,225 | 335,055 | 17,509 | 42,702 |
| DDI | \$3,648,580 | 16,012,876 | 152,480,933,565 | 430,448,705 | 26,936,875 | 837 |
| DDI | \$6,000,000 | 15,565,938 | 148,225,006,773 | 418,434,362 | 26,185,034 | 1,333 |
| Incident Management | \$2,320,000 | 317,429 | 1,186,553,707 | 1,809,723 | 128,174 | 28,115 |
| Signal Timing/Upgrade | \$700,000 | 106,893 | 475,327,482 | 588,630 | 98,203 | 20,648 |
| Signal Timing/Upgrade | \$288,000 | 88,110 | 558,547,492 | 813,005 | 49,622 | 8,244 |

Final Projects - Regional Equity



Final Projects - Regional Equity

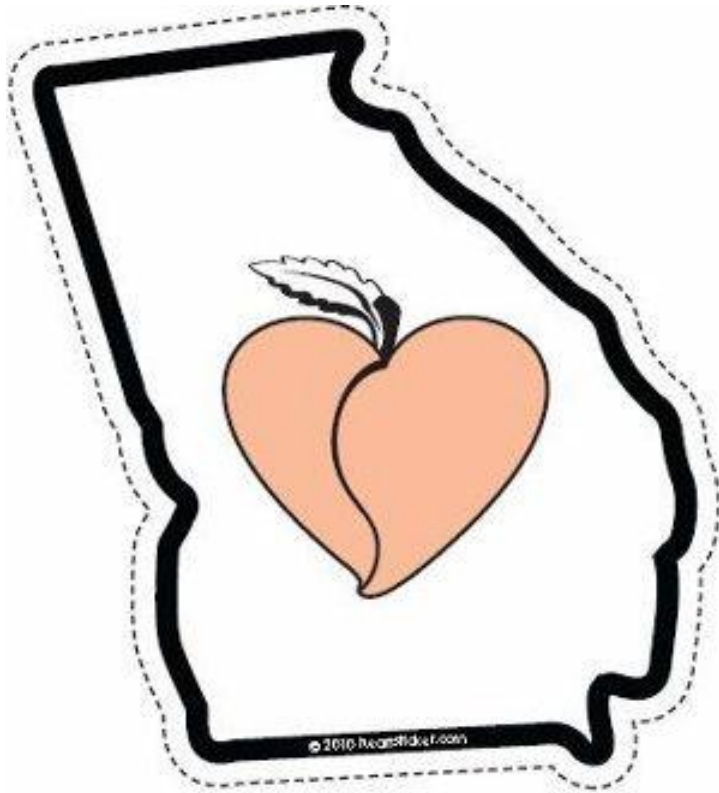


2013 Solicitation - Lessons Learned



- Project sponsors need more time to prepare thorough/thoughtful applications
- Create a more robust application process in future solicitations
- Local sponsors have some issues working through deliverability
- Take technical results with a grain of salt...

Interaction with State



- State and ARC partnered through the entire process
- Differences in opinion were managed up-front through the establishment of emphasis areas
- State a great asset in determining deliverability, eligibility, historical know-how
- MPO brings air quality know-how from conformity process

Contact Information

David D'Onofrio
ddonofrio@atlantaregional.com
(404) 463-3268