



# ADVANCED TRANSPORTATION AND CONGESTION MANAGEMENT TECHNOLOGIES DEPLOYMENT INITIATIVE

Funding Opportunity  
Number 693JJ317NF0001



Submitted by Pinellas County Department of Public Works in association with City of Clearwater, City of St. Petersburg, Forward Pinellas, Pinellas Suncoast Transit Authority, and the Florida Department of Transportation



<b>Project Name</b>	<b>Pinellas County Integrated System for Coordinated Event Strategies (PISCES)</b>
<b>Eligible Entity Applying to Receive Federal Funding</b>	Pinellas County Department of Public Works
<b>Total Project Cost (from all sources)</b>	\$ 26,428,014
<b>ATCMTD Request</b>	\$ 11,843,154
<b>Are matching funds restricted to a specific project component? If so, which one?</b>	Yes, \$862,000 in-kind is restricted to St. Petersburg parking project
<b>State(s) in which the project is located</b>	Florida
<b>Is the project currently programmed in the:</b> <ul style="list-style-type: none"> <li>▪ <b>Transportation Improvement Program (TIP)</b></li> <li>▪ <b>Statewide Transportation Improvement Program (STIP)</b></li> <li>▪ <b>MPO Long Range Transportation Plan</b></li> <li>▪ <b>State Long Range Transportation Plan</b></li> </ul>	TIP = Yes STIP = Yes MPO LRTP = Yes State LRTP = Yes
<b>Technologies Proposed to Be Deployed (briefly list)</b>	<ol style="list-style-type: none"> <li>1. Data Fusion Environment</li> <li>2. Parking Management</li> <li>3. Connected Vehicle Technologies</li> <li>4. Automated Vehicles</li> <li>5. Integrated Corridor Management</li> <li>6. Decision Support System</li> <li>7. Performance Measures System</li> <li>8. Mobility on Demand Regional Application</li> <li>9. Drones</li> </ol>

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# 1. PROJECT NARRATIVE

## 1.1. Introduction

The Pinellas County Department of Public Works submits this grant application to the U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) under the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) program. The application is being submitted by Pinellas County on behalf of the Region.

Pinellas County experiences seasonal traffic pattern fluctuations due to Clearwater Beach especially during Spring Break months; combined with Spring Training Baseball; and regular season MLB games at Tropicana Field all which provide the need for improved event coordination within the county. The Pinellas County Integrated System for Coordinated Event Strategies (PISCES) will provide a testbed for various technologies and strategies for managing special events within the region. Pinellas County will deploy technologies to assist the region with multi-modal and multi-agency strategies for mobility within the region; to include data fusion of regional systems with a decision support system; utilizing connected vehicle technologies to improve safety for pedestrians and intersections at beach locations; and providing mobility on demand services to include automated vehicle shuttles, parking management, and a mobility on demand application leveraging the Pinellas Suncoast Transit's recent MOD Sandbox grant, and first last mile agreement with Uber.

Pinellas County and its partners are seeking to implement an integrated regional mobility and

special event management system under the ATCMTD grant. The goal of the effort is to enhance safety and mobility across the Region through fulfillment of the following:

- Balancing multi-modal demand at major bridge crossings and within the special event corridors through active demand management to provide acceptable levels of service;
- Utilizing connected vehicle technologies to improve safety of intersections and for pedestrians;
- Utilizing analytics and dashboards to monitor current conditions within the county;
- Expansion of existing regional mobility efforts (MOD Sandbox, Direct Connect partnership) to provide additional mobility services including an integrated mobile application of all transportation services, use of automated vehicle shuttles to supplement ridesharing and parking management services centered around special event areas.
- Expansion of ITS Infrastructure in St. Petersburg, Gulf Blvd, and SR60

To realize these achievements, the grant effort focuses on the following initiatives:

1. *Enhance Data Collection, Fusion, Distribution and Archiving*
  - a. Development of a Data Fusion Environment to collect and fuse Traffic Signal (Cities and County), Transit information (Pinellas Suncoast Transit Authority), Freeway (FDOT), and Arterial (City and County) information

2. *Improve Safety of Pedestrian and Intersections within the Region*
  - a. Deploy Pedestrian/ Intersection Connected Vehicle Technologies along the Clearwater Beach arterials
3. *Provide the Economically and Socially Disadvantaged with additional Mobility Options*
  - a. Leverage PSTA first mile/ last mile service (Direct Connect)
  - b. Deploy Automated Vehicle Shuttles
4. *Improve Incident Response to Special Events in the Region*
  - a. Develop ICM Strategies including Multi-modal Multi-agency response plans
  - b. Develop Decision Support System for response plan coordination
  - c. Develop Mesoscopic Model to evaluate and predict conditions with special event corridors
  - d. Utilize Drones for surveillance
5. *Expand Regional Smart Mobility*
  - a. Deploy a parking management system around the Clearwater Beach and downtown St. Petersburg area and/or around major trip generators, such as hospitals, stadiums, special events, downtown business areas and more.
  - b. Integrate real-time and forecast weather information system and the alerting applications within the Region.
  - c. Develop a dynamic Regional Decision Support System and performance measures application to ensure optimized operational level of service.
6. *Expand Regional Mobility as a Service offerings*
  - a. Automated Vehicle shuttles to transport people from parking areas to the beach
  - b. Mobile Application for Mobility on Demand Services
- c. Leverage MOD Sandbox Application for Paratransit
- d. Leverage first mile/ last mile agreement with Uber
7. *Improve Monitoring and Surveillance of Infrastructure*
  - a. Deployment of Drone technologies for surveillance during special events, and for monitoring/ inspection of key infrastructure in the region (i.e. causeway bridges)

Most of the proposed initiatives should be broadly transferable to other areas of the state and country. PISCES is intended as a showcase for deployment of a multi-agency, multi-modal, integrated regional mobility management system focused on Special Event management.

## 1.2. Entity Entering the Agreement

Pinellas County Department of Public Works (DPW) will be the agency with overall responsibility for completion of the ATCMTD Initiative. DPW is submitting the application on the Region's behalf.

The point-of-contact for our proposal is:

Ken Jacobs  
 Transportation Division Director  
 Pinellas County Department of Public Works  
 22211 U.S. 19 N.  
 Clearwater, FL 33765  
 (727) 464-8928  
[kjacobs@pinellascounty.org](mailto:kjacobs@pinellascounty.org)

### 1.2.1. Partners

DPW has partnered with many of its local stakeholder agencies, and several private partners, described in Section 1.11, with existing relationships within the region. These stakeholder partners include:

- Florida Department of Transportation
- City of Clearwater
- City of St. Petersburg

- Forward Pinellas
- Pinellas Suncoast Transit Authority
- Center for Urban Transportation (CUTR)

### 1.2.2. Management Approach

Pinellas County Department of Public Works will be the primary manager of the PISCES project. Pinellas County in cooperation and coordination with its regional partners will provide all progress reporting to the USDOT, with input from the local stakeholders and consultants.

Pinellas County is committed to manage this project to meet the scope, schedule, and budget. We are well versed in Project Management methodologies and Systems Engineering methodologies.

We will utilize Project Management Institute (PMI) standards in the development of our Project Management Plan. Several individuals within our team have Project Management professional (PMP) certification and will assist in the development of the project management methodology for this project. Per PMI, Project Management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project management process of initiating, planning, executing, monitoring and controlling, and closing.

The project management plan will describe how the project management system will be used and states how the work will be performed. As with any project, the management of it will consider the triple constraint of project scope, budget, and schedule.

We will use an INCOSE based Systems Engineering process, beginning with a planning phase to develop the operational concept, and system requirements.

### 1.3. Geographic Area

Pinellas County is located on the Gulf Coast of Florida. The county seat is the City of Clearwater and its largest city is St. Petersburg. Pinellas County is included in the Tampa-St. Petersburg-Clearwater Metropolitan Statistical Area (urban area) along with Hillsborough and Pasco Counties. The total population of the urban area is 2,758,122 (2015), 18th largest in the United States. The population of Pinellas County is 944,971 (2015), with an additional 78,340 seasonal population (2015) and 6.2 million tourist visitors (2015). The population density of Pinellas County is the highest of all counties in Florida at 3,347 persons per square mile.

The PISCES Project is focused on Special Event Management within the County in three specific areas: Clearwater Beach; Spectrum Field; and Downtown St. Petersburg/Tropicana Field.

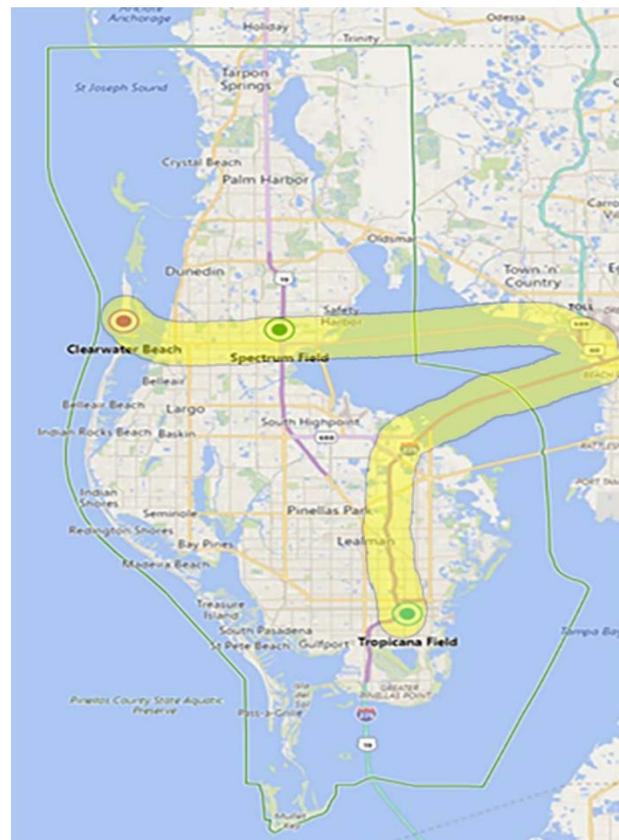


Figure 1: Pinellas County Corridors

### 1.3.1. Clearwater Beach

Clearwater Beach includes a resort area and a residential area on the Gulf of Mexico in Pinellas County on the west central coast of Florida. Located just west over the Intracoastal Waterway by way of the Clearwater Memorial Causeway from the City of Clearwater, Florida, of which it is part.



Clearwater Beach is characterized by white sand beaches stretching for 2.5 miles (4 km) along the Gulf and sits on a barrier island. It has a full marina on the Intracoastal Waterway side and is linked on the south by a short bridge to another barrier island called Sand Key, where Sand Key Park is located. Clearwater Beach was named No. 1 in the U.S. on TripAdvisor's list of Top Beaches for 2016 and No. 4 in 2017.

### 1.3.2. Spectrum Field

Spectrum Field (formerly Bright House Networks Field and Bright House Field) is a baseball stadium located in Clearwater. The stadium was built in 2004 and has a maximum seating capacity of 8,500 people (7,000 fixed seats with additional grass berm seating for 1,500).



The Phillies have been training in Clearwater, Florida since 1948. Carpenter Field, which was built in 1967, is used in Spring Training by the Phillies' major league and Minor League players, along with teams in the Florida State League, Gulf Coast Rookie League and the Florida Instructional League.

### 1.3.3. Downtown St. Petersburg/ Tropicana Field

St. Petersburg is a city in Pinellas County, Florida with a population of 257,083, making it the fifth-most populous city in Florida and the largest in the state that is not a county seat. Downtown St. Petersburg is the city's heart, replete with shops, restaurants, bars and attractions. St. Petersburg's downtown has been rated among the best in the South. The area's beaches are a 10-mile (16 km) drive from downtown. The St. Petersburg Pier, a major tourist attraction offers various activities, and is being reconstructed.



Tropicana Field is a domed stadium in St. Petersburg that has been the home of the Tampa Bay Rays of Major League Baseball (MLB) since the team's inaugural season in 1998. The stadium is also used for college football, and since December 2008 has been the home of the St. Petersburg Bowl, an annual postseason bowl game. It is currently the only non-retractable domed stadium in Major League Baseball.

### 1.3.4. Highway Systems

The existing highway network in the Pinellas County region includes several controlled

access highways. Primary access from Tampa into Pinellas County is through 3 major bridge crossings. These routes are the primary routes for Hurricane Evacuation in the area, and thus are critical to the region. The existing highway network within Pinellas County is shown in Figure 2, below includes I-275, I-175, I-375, US-92, and US-19. Interstate highways are operated by the FDOT as part of their regional SunGuide Freeway Management System. I-275 is the primary route from Tampa into downtown St. Petersburg. SR 60/Gulf-to-Bay Boulevard is the northernmost east-west corridor and travels across Clearwater from Clearwater Beach in the west, connecting the city to Hillsborough County and the area around Tampa International Airport via the Courtney Campbell Causeway.



Figure 2: Regional Highways

1.3.5. Arterial Systems

Currently, each arterial management agency operates and maintains their own signal systems, as shown in the table below. As Pinellas County implements the new ATMS

system, arterial signals are moved to the central system to be operated on a regional basis. However, existing systems do overlap jurisdictionally and as part of this project will be more synchronized as part of the ICM response plans and Decision Support System.

Table 1-1: Traffic Signals in the County

Agency	# of TS	Controller Types	Central Software
Pinellas County	425	Econolite	MIST
City of Clearwater	100	Econolite	Centracs
City of St. Petersburg	285	Econolite	Centracs

The current system configuration managed by Pinellas County includes operation of 425 traffic signals of which over 190 intersections can run one of three Adaptive Signal Control software packages; 132 CCTV cameras; 54 arterial Dynamic Message Signs (DMS); 180+ miles of fiber optic communications cable; and 100+ Bluetooth travel time sensors.

Pinellas County currently uses three Adaptive Signal Control systems within the county corridors including OPAC, InSync and Centracs.

1.3.6. Transit

The PSTA operates 210 buses servicing 4,929 bus stops on 40 routes across the county, with major stops at all commercial centers. Along the Gulf Beaches, PTSA operates the Suncoast Beach Trolley. PTSA also offers two express routes to downtown Tampa connecting with Tampa's Hillsborough Area Regional Transit (HART) Lines and the Pasco County Public Transportation (PCPT) Lines. The system's two main bus terminals are in downtown Clearwater and downtown St. Petersburg. PSTA provided more than 14.9 million passenger trips in FY 2015.



**Figure 3: PSTA Bus System Map**

PSTA has partnered with Uber and United Cab to solve the first-mile, last-mile problem. PSTA covers up to \$5, if passengers are going to or from a bus stop in designated zones. This program started in February 2016 and is the first of its kind in the country. Under the new system, riders will open their Uber app and toggle over to the PSTA option. They can then page a nearby driver, and the credit will be automatically applied. The program, which will increase accessibility and ridership, illustrates PSTA's willingness to innovate to reach new riders.

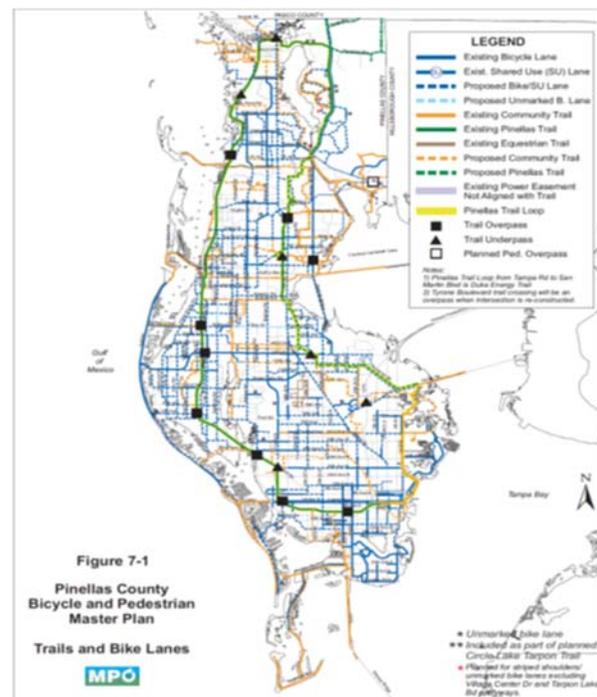
### 1.3.7. Pedestrians

Concentrated pedestrian traffic occurs along the corridors of this project and at the coastal beaches, particularly Gulf Boulevard, which have high levels of tourism and daily pedestrian traffic. Crossing in these environments creates a dangerous situation for both pedestrians and drivers. Pinellas County ranks very high in accidents and fatalities

associated with vulnerable roadway users. In 2015, there were 3.72 pedestrian fatality per 100,000 people.

### 1.3.8. Bicycle

The 2040 LRTP provides transportation options for all Pinellas County residents, including people who need or choose to walk or bike to their destinations. Pinellas County has an extensive network of trails, bicycle lanes, and sidewalks. Significant investment has been made to the trail system and the miles of completed and planned trails. The intent is to provide connections that are easy to use and that provide a safe and enjoyable way to travel around the county.



**Figure 4: Bicycle and Pedestrian Trails**

The Pinellas Trail is nationally renowned and, when completed, will loop its way through the county with connections to Pasco County and Hillsborough County. Additional community trails provide connections south to Fort Desoto, west to the beaches, and east-west connections throughout the county from the Pinellas Trail spine. An expansive network of

Table 1-2: Pinellas County Crash Trends, 2011-2015

PINELLAS COUNTY CRASH TRENDS	2011	2012	2013	2014	2015	5 Year % Change (2011-2015)
Total Motor Vehicle Crashes	14,896	18,071	24,624	26,580	28,501	62%
Total Injuries	5,416	3,859	4,502	4,249	4,426	-20%
Total Fatalities	114	101	80	117	101	-12%
Total Pedestrian Crashes	434	534	578	570	572	27%
Total Pedestrian Fatalities	30	30	25	40	36	18%
Total Bicycle Crashes	483	580	548	572	471	-2%
Total Bicycle Fatalities	10	11	9	7	3	-107%
Total Motorcycle Crashes	541	499	619	640	669	21%
Total Motorcycle Fatalities	28	20	16	29	26	-7%

bicycle lanes exists throughout the county, with many additional connections planned to allow people to have another option for traveling to their destinations. Installation of new bike lanes is often accomplished through roadway resurfacing projects.

## 1.4. Issues and Challenges

### 1.4.1. Crashes

In 2015, a total of 28,501 motor vehicle crashes were reported in Pinellas County. Of these, 99 resulted in one or more fatalities, while 3,465 caused serious injuries. For most crashes (20,798), there were no injuries or fatalities reported. There were 101 traffic crash fatalities in Pinellas County in 2015-16 less fatalities than the 117 in 2014.

Reducing the number of traffic crashes remains a challenge given increases in population, VMT, the number of licensed drivers, and the declining price in the cost of a gallon of gasoline. As these numbers steadily increase, Pinellas County continues to face challenges in reducing the number and severity of traffic crashes.

Historically, traffic crash frequency has been the preferred approach to analyze and measure the safety of an intersection and/or road segment in Pinellas County. While crash frequency is one of the simplest forms of crash

data analysis, it does have limitations when comparing roadways that carry high volumes of traffic to roadways that have much less capacity, and thus smaller numbers of crashes. For the 2016 Traffic Crash Trends and Conditions Report a different methodology was used. Crash rates were calculated for all intersection and roadway segments within the Forward Pinellas Transportation Planning Inventory (TPI) network database. Crash rates were calculated by adding the number of crashes of the individual intersections or roadway segments and dividing the sum of the entering traffic volumes, converted to million vehicles entering (for intersections) or million vehicle miles traveled (for roadway segments). This metric is considered a more reliable measure of the relative safety of an intersection or segment because it incorporates exposure data into the calculation which allows for a more effective comparison of varying locations throughout the transportation system.

During 2015, the intersection with the greatest crash rate was Gulf-to-Bay Boulevard (S. R. 60) & Belcher Road, followed by U.S. Highway 19 & Tampa Road. Collision diagrams for the Gulf-to-Bay Boulevard (S. R. 60) & Belcher Road and the U.S. Highway 19 & Tampa Road intersections were evaluated to determine the dominant crash type. For both intersections, rear end collisions accounted

Rank	Main Route	Minor Route	Jurisdiction	No. of Crashes	Total Intersection AADT	Intersection Crash Rate
1	S.R. 60	Belcher Road	Clearwater	141	73,904	5.23
2	U.S. Highway 19	Tampa Road	Unincorporated	170	107,523	4.33
3	54 <sup>th</sup> Ave. S.	31 <sup>st</sup> Street South	St. Petersburg	46	36,492	3.45
4	Alternate 19	Curlew Road	Dunedin	42	34,241	3.36
5	66 <sup>th</sup> St. N. (S.R. 693)	38 <sup>th</sup> Avenue North	St. Petersburg	72	62,396	3.16
6	U.S. Highway 19	Drew Street	Clearwater	131	116,958	3.07
7	U.S. Highway 19	Curlew Road	Unincorporated	128	115,750	3.03
8	U.S. Highway 19	Alderman Road	Unincorporated	89	86,758	2.81
8	Gandy Boulevard	4 <sup>th</sup> Street North	St. Petersburg	77	75,125	2.81
9	Alternate 19	Rosery Road	Largo	45	44,215	2.79
10	Fort Harrison Avenue	Chestnut Street	Clearwater	33	32,776	2.76

**Table 1-3: Top 10 Intersections for Crashes**

30% and 58% respectively, for all collisions that occurred at these intersections. It is important to note that even though U.S. Highway 19 is grade-separated through the Drew Street area, this intersection is still experiencing a high rate of traffic crashes because of the high number of at-grade conflict points below the overpass.

Shown in Table 1-3 is a listing of the Top 10 intersections based on crash rate.

#### 1.4.2. Tourism – Impact

Tourism is Pinellas County's second leading industry, and while it places additional demands on the area's roadway network, i.e., more out-of-county and out-of-state cars as well as rental cars added to the transportation system, it also provides revenue to fund

transportation projects via sales tax and gas tax revenues. If the condition, availability and efficiency of the transportation system is perceived by visitors as favorable, that impression contributes to Pinellas County's overall desirability (and marketability) as a tourist destination.

The St. Petersburg/ Clearwater Area Convention and Visitors Bureau's Annual Visitor Profile reported an increase from the previous year of 2.7% in 2012, 2.3% in 2013, 4.7% in 2014, 4.8% in 2015, and 1.8% in 2016. Figure 5, below, shows the monthly values of tourism in the County – which indicates the tremendous fluctuations that occur and which cause transportation issues related to the number of visitors, including transit ridership, parking, and traffic congestion.

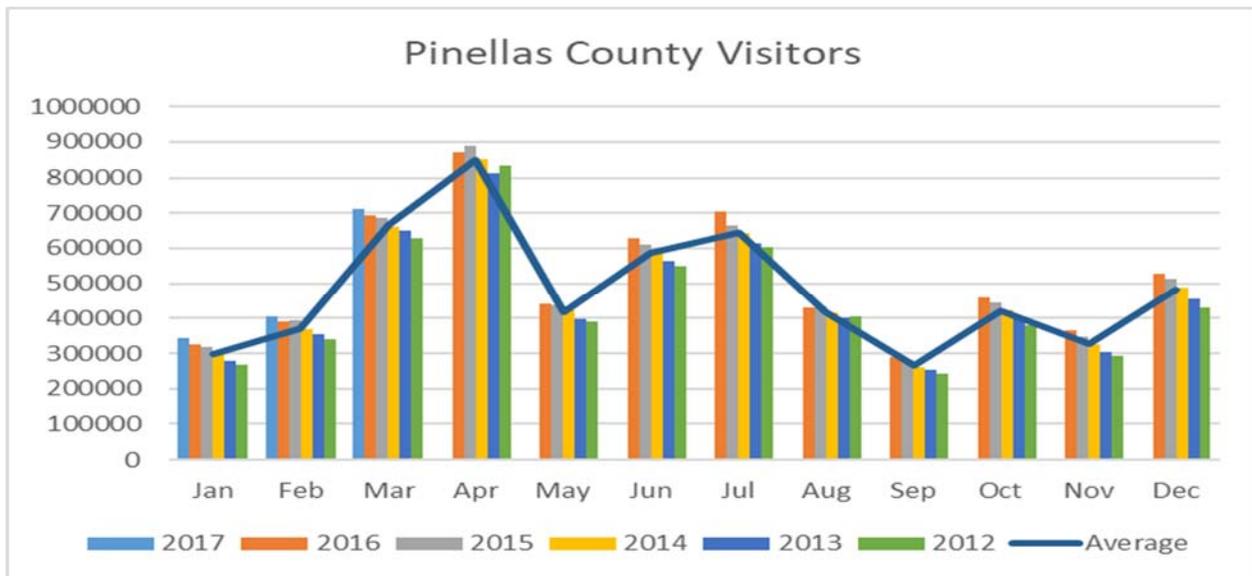


Figure 5: Impact of Tourism in Pinellas County, Monthly Totals

The peak impact tends to be related to the annual occurrence of Easter and spring break for schools and colleges.

### 1.4.3. Environmental Justice

The MPO conducted a demographic analysis of Pinellas County for the LRTP in August 2012. This included the summarization of minority and/or low income population groups by Census Tract into EJ areas. Information on low income population was not available from the 2010 Decennial Census, and was instead drawn from the 2006-2010 American Community Survey 5-Year Estimates. EJ areas for minorities were defined by where the minority population is meaningfully greater than the minority population percentage in the general population. The county wide average percentage of minority populations per census tract is 21.6%.

Low-income is defined as those living below the poverty level in Pinellas County, as determined by the Census Bureau. The average low-income population by census tract in Pinellas County is 12.1. For this analysis, any census tract with a low-income population that exceeds 20% has been identified as an EJ area.

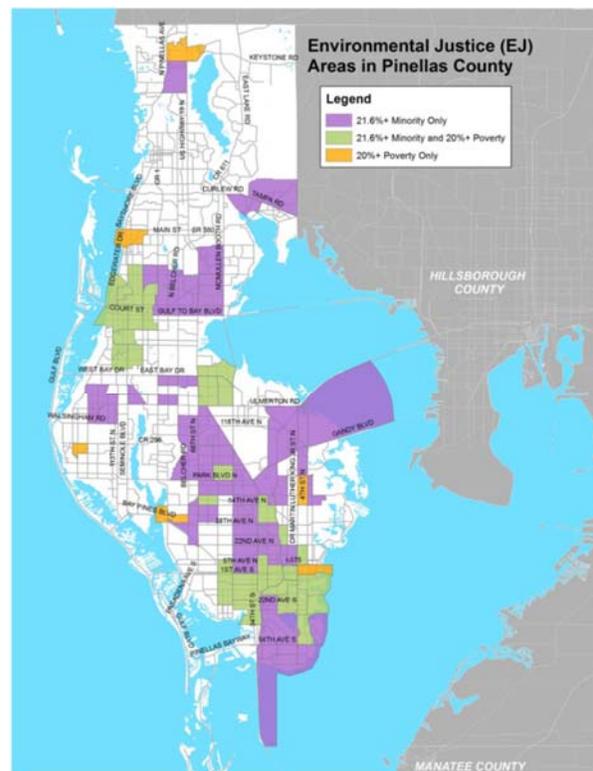


Figure 6: Pinellas County Environmental Justice Areas

## 1.5. Vision, goals, and objectives

With the high tourism activities, adverse weather conditions and major sport activities as well as a Regional transportation network managed by multiple independent agencies, the Region has realized the need for better coordination and management of the transportation network.

In general, the Region and agencies handle their typical recurring traffic and congestion and manage their facilities as expected without much coordination of operations with others. Given the current situation the Region is not ready to deal with unexpected events in the most efficient manner, utilize the available alternative routes, coordinate operations and work as a team to manage the event as efficiently as possible.

### 1.5.1. Vision

The PISCES Project is a collaborative effort between Pinellas County Department of Public Works, Florida Department of Transportation, the City of Clearwater, the City of St. Petersburg, Pinellas Suncoast Transit Authority, and Forward Pinellas. The Vision for PISCES is:

**“Operate Pinellas County in a true multimodal, integrated, efficient, and safe fashion where the focus is on the mobility of the transportation customer”**

### 1.5.2. Goals

The primary Regional transportation mobility goals are:

- **Enhance Data Collection, Fusion, Distribution and Archiving -**  
Development of a Data Fusion Environment to collect and fuse Traffic Signal (Cities and County), Transit information (Pinellas Suncoast Transit Authority), Freeway (FDOT), and Arterial (City and County) information. The building blocks of any multi-agency, multi-modal integrated system is its data

collection, fusion, storage and archiving applications and every goal mentioned will rely on this function one way or another. With the USDOT’s recent ruling on the need to develop performance measures reports, the need to automate the entire process is essential.

- **Provide for Operational Integration within PSTA and with Regional Mobility** – Transit plays an important role in the region. In addition to serving local commuters within the Pinellas County region, the PSTA also serves tourists and others new to the region. Transit also plays an important role in offering alternate modes of transportation to travelers and particularly during major events. There are potential opportunities to improve PSTA internal operations as well as its integration with the regional mobility concept.
- **Improve Incident Response to Special Events in the Region -** Develop ICM Strategies including Multi-modal Multi-agency response plans. Develop Decision Support System for response plan coordination. Develop Mesoscopic Model to evaluate and predict conditions with special event corridors
- **Accelerated deployment of vehicle-to-vehicle, vehicle-to-infrastructure, and automated vehicle applications, and autonomous vehicles and other advanced technologies** – Deployment of CV technologies for pedestrian and intersection safety; deployment of automated vehicle shuttles within parking areas around Pier District of Clearwater Beach and Beach Drive of St. Petersburg
- **Provide Technologies to Support Connected Communities -** Deployment of technologies for a multimodal transportation system provides Americans with safe, reliable, and affordable connections to employment, education, obtain and provide healthcare, and other essential services. Leverage PSTA first

mile/ last mile service. Deploy Automated Vehicle Shuttles

- **Proactively provide accurate, real-time and forecasted tailored weather information** – Weather has been a major cause of incidents and congestion in the Region and is critical for Hurricane Evacuation. The severity of adverse weather impacts on many occasions will result in closure of roadways due to incidents related activities. The knowledge of accurate weather conditions in the near future will result in better management of facilities and operations related decisions that will maximize safety while informing the operating agencies and travelers in advance of such activities.
- **Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety** – Deployment of V2X technologies for intersection and pedestrian safety. Deploying Automated Vehicle shuttles will reduce the potential for pedestrian accidents caused by bus driver blind spots.
- **Expand Regional Smart Mobility** - Deploy a parking management system around the Clearwater Beach area and/or around major trip generators, such as hospitals, stadiums, special events, downtown business areas and more. Integrate real-time and forecast weather information system and the alerting applications within the Region. Develop a dynamic Regional Decision Support System and performance measures application to ensure optimized operational level of service.
- **Improve Monitoring and Surveillance of Infrastructure** - Deployment of Drone technologies for surveillance during special events, and for monitoring/ inspection of key infrastructure in the region (i.e. causeway bridges)

## 1.6. Transportation Systems and Services

The following Table summarizes the transportation systems and services that are proposed for the project. It also details the purpose of the system/service and the specific technology/system to be deployed to support that system/service. Traffic data is collected and processed, and made available to the operators on various platforms. In that regard, our proposed system will:

- Consolidate the various data sources into one single, centralized database and make it available to the operators through a multi-layered dynamic map.
- Implement Performance Measures platform to dynamically monitor and operate the Regional transportation network based on performance measures.
- Implement an Expert Rule Engine and simulation model as the DSS application to assist Regional stakeholders with cooperatively responding to Regional incidents, congestion, and events.
- Provide Parking Management Services of St. Petersburg and Clearwater parking spaces, including the installation of detectors, a parking management software system and providing data to the data mart.
- Provide CV technology to the region by deploying roadside and onboard devices and data fusion of the V2I data into Regional transportation management systems.
- Share the fused data with Regional partners through one Data Mart
- Deploy AV shuttles to provide additional mobility options, and provide demonstration of AV technologies in mixed traffic.
- Use Unmanned Drones to view traffic conditions during special events, and responses to congestion. In addition,

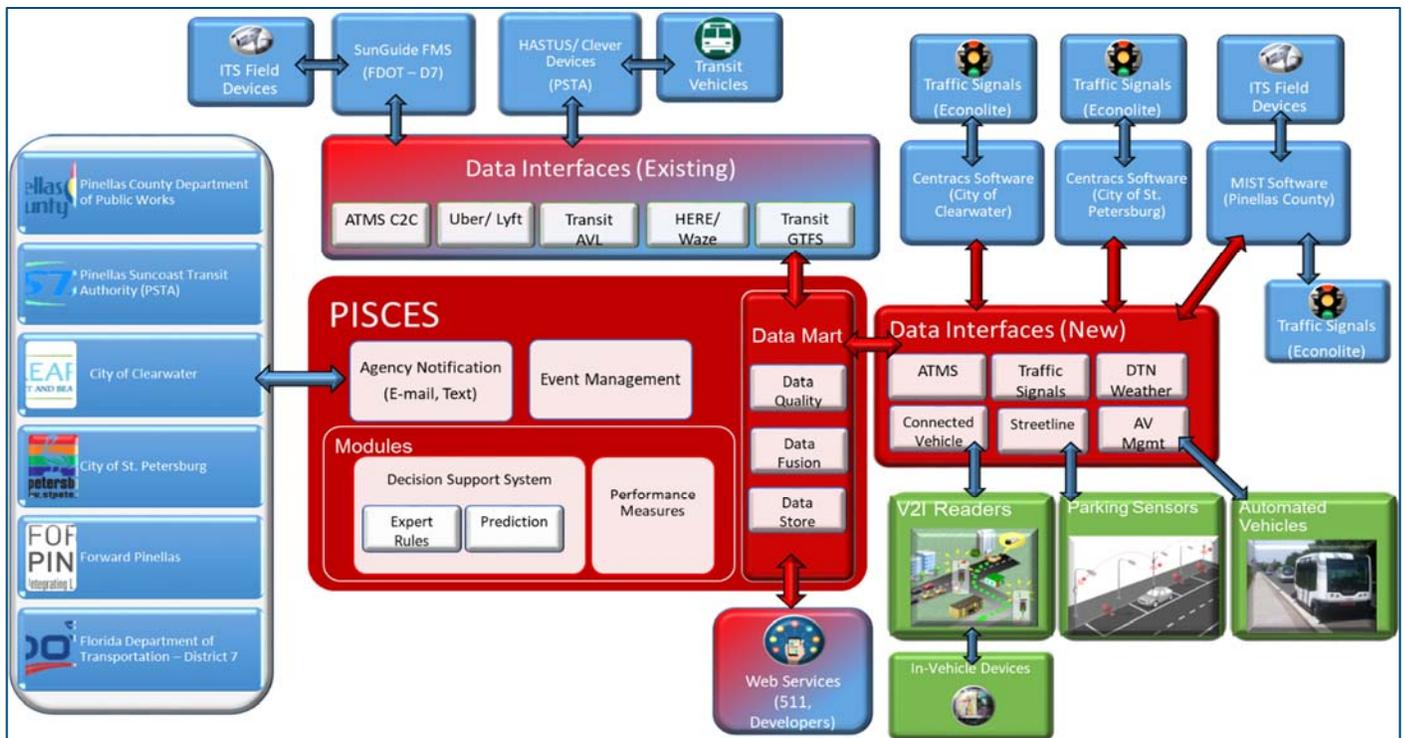


Figure 7: PISCES Logical Architecture

Drones will be used for inspection of key infrastructure, especially after Hurricane Events.

The implementation of these coordinated strategies requires the development of a new and potentially complex set of inter-jurisdictional agreements and operating procedures.

### 1.6.1. Data Fusion Environment

The data fusion engine (DFE) is the center piece of the entire system. As the data becomes available, they are fused, stored, shared with various internal and external applications and stored and archived for the development of real-time and archived performance measures analysis. The performance measures application will be used to archive data and provide agencies with the ability to create performance measures as well as configured operational dashboards per the agency’s needs.

The Data Interfaces (DI) will extract data from the data sources, validate it, transform it into a suitable format for retrieval and analysis, and

store the data into one of the data warehousing components. The data warehousing components consist of traditional data warehousing technologies such as SQL Server relational database management system, an ArcGIS Data Store, and unstructured data storage components.

The DFE represents a paradigm shift from silos of information and applications to a shared data environment that synergizes data streams and data sources not previously integrated to support data analytics of value not previously captured.

The DFE will extract, transform, and load traditional structured and transactional data, unstructured data, and geographical and time-based data in a way to support efficient search, retrieval, and analysis. The DFE subsystem will provide DIs to the data sets, data streams, and derived data sets and data streams based on a processed output of other data sets and data streams. The DFE subsystem will be designed to label and store multiple versions of a data source to accommodate simulated data to

facilitate simulation and testing for the integration, test, maintenance, and training activities of PISCES while also maintaining live, production operations.

#### 1.6.1.1. Data Interfaces

The data interfaces that will be deployed for PISCES which are used to collect data, fuse the data, and store the data in the data warehouse for use by the other systems include:

- **Traffic Signal Data** – Traffic Signal Status, Location, and Timing Plan data from the Centrac and MIST systems
- **GTFS Data** - Transit Schedule and Route Data will be collected from the PSTA GTFS data feed
- **Transit AVL Data** – The real-time location of transit vehicles will be collected from the Clever Device data feed.
- **AV Shuttle Data** – The AV Shuttle management system provides an interface for other systems to receive location and status information for the shuttles.

- **Weather Data** – Weather forecast and radar information will be integrated from the DTN weather service
- **ATMS Data** – ITS device (DMS, CCTV), speed, volume, occupancy, and event data will be received from the FDOT SunGuide C2C interface and the Pinellas County MIST system
- **V2X Data** – Connected Vehicle information will be received from the Road Side Units (RSU) deployed within the region
- **Parking Management Data** – Parking Data will be received from the Streetline Parking Management system for St. Petersburg and Clearwater
- **3<sup>rd</sup> Party Data** – Traffic information will be integrated from three different providers: HERE, Uber, and Waze.

Data interfaces will be developed and deployed based on the availability of the source systems, and the experience of the systems integration team, as shown in Figure 8 below.

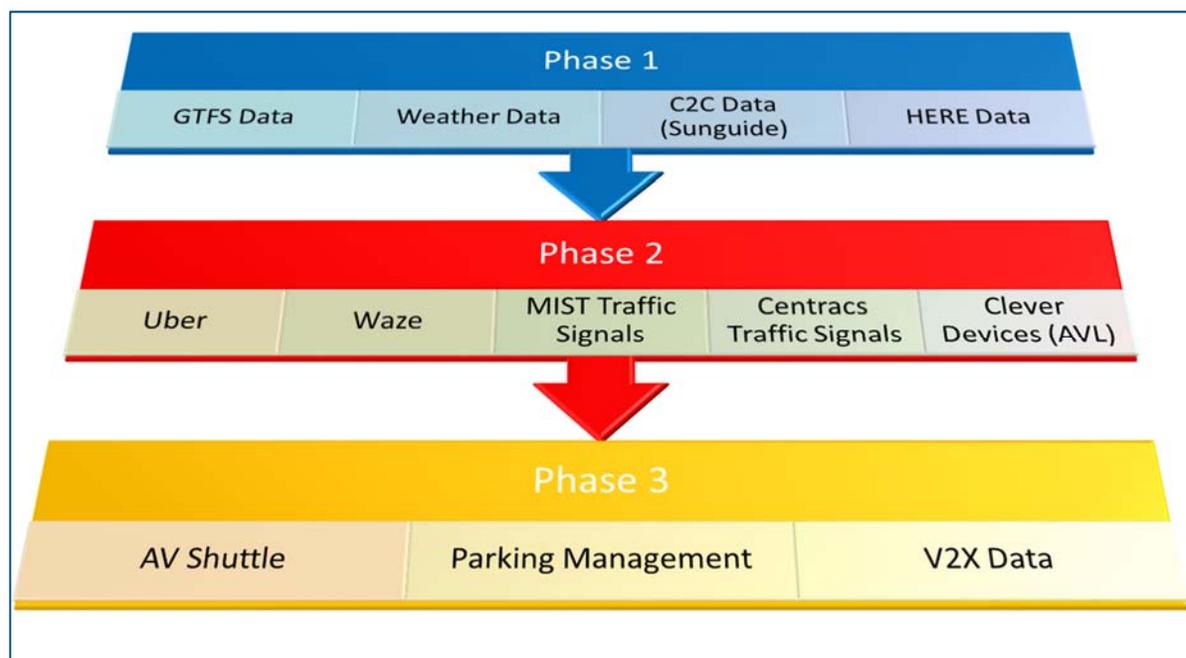


Figure 8: Data Interface Integration Phasing

Table 1-4: Solutions to meet the Goals of the Project

Goal	Solution Description	Proposed Technologies
<p><b>Enhance Data Collection, Fusion, Distribution and Archiving</b></p>	<ul style="list-style-type: none"> <li>▪ Enhance the ability to collect, fuse and distribute data for all manner of performance measures, performance management, real-time operations and real-time information including</li> </ul>	<ul style="list-style-type: none"> <li>▪ Data Fusion Environment</li> <li>▪ Performance Measures</li> </ul>
<p><b>Provide for Operational Integration within PSTA and with Regional Mobility</b></p>	<ul style="list-style-type: none"> <li>▪ Integrate PSTA operational data and systems within the Regional mobility concept</li> <li>▪ Offer transit as an alternative strategy to roadways and vice versa.</li> <li>▪ Provide real-time transit information to public via an integrated mobility mobile application</li> <li>▪ Offer additional regional mobility to travelers including Uber, Lyft, United Taxi, Jolley Trolley, AV shuttle, Looper, and CareRide.</li> </ul>	<ul style="list-style-type: none"> <li>▪ AV Shuttles</li> <li>▪ Mobility on Demand Sandbox Solution</li> <li>▪ Regional Mobility Mobile App</li> </ul>
<p><b>Improve Incident Response to Special Events in the Region</b></p>	<ul style="list-style-type: none"> <li>▪ Improve coordination among responders by implementing a system that will facilitate the robust and timely exchange of information including incident location, response needed, incident status, etc.</li> <li>▪ Provide Decision Support system to assist agencies with coordination and planning for special events</li> </ul>	<ul style="list-style-type: none"> <li>▪ Decision Support System</li> <li>▪ Performance Measures</li> <li>▪ Data Fusion Environment</li> </ul>
<p><b>Accelerated deployment of vehicle-to-vehicle, vehicle-to-infrastructure, and automated vehicle applications, and autonomous vehicles and other advanced technologies</b></p>	<ul style="list-style-type: none"> <li>▪ Provide timely, accurate and actionable real-time and dynamic traffic information to CVs via existing mobile apps.</li> <li>▪ Conduct a CV pilot to improve safety in Pier District for Pedestrians</li> <li>▪ Deploy Automated Vehicle Shuttles to provide for additional mobility options and improve safety</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deployment of RSUs within special event corridors</li> <li>▪ Pedestrian and Intersection safety applications</li> <li>▪ Automated Vehicle Shuttles</li> </ul>

Goal	Solution Description	Proposed Technologies
<p><b>Provide Technologies to Support Connected Communities</b></p>	<ul style="list-style-type: none"> <li>▪ Provide Mobility Services to provide residents with safe, reliable, and affordable connections to employment, education, obtain and provide healthcare, and other essential service</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mobility on Demand</li> <li>▪ Direct Connect first mile/ last mile services</li> <li>▪ Regional Mobility Mobile Application</li> <li>▪ AV shuttles</li> <li>▪ Parking Management</li> </ul>
<p><b>Proactively provide accurate, real-time and forecasted tailored weather information</b></p>	<ul style="list-style-type: none"> <li>▪ Implement a robust weather forecast and alert system to warn residents and travelers of inclement weather and delays</li> <li>▪ Provide improved alerting and management of hurricane evacuation</li> </ul>	<ul style="list-style-type: none"> <li>▪ DTN Weather</li> </ul>
<p><b>Reduction in the number and severity of traffic crashes and an increase in driver, passenger, and pedestrian safety</b></p>	<ul style="list-style-type: none"> <li>▪ Provide timely, accurate and actionable real-time and dynamic traffic information to CVs via existing mobile apps.</li> <li>▪ Conduct a CV pilot to improve safety in Pier District of Clearwater Beach and Beach Drive in St. Petersburg for Pedestrians</li> <li>▪ Implement Signal Phase &amp; Timing (SPaT) messaging at signalized intersections</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deployment of RSUs within special event corridors</li> <li>▪ Pedestrian and Intersection safety applications</li> <li>▪ Automated Vehicle Shuttles</li> </ul>
<p><b>Expand Regional Smart Mobility</b></p>	<ul style="list-style-type: none"> <li>▪ Deploy a parking management system near special event locations such as; stadiums, downtown business areas and beaches.</li> <li>▪ Integrate real-time and forecast weather information system and alerting application within the Region.</li> <li>▪ Deploy a Regional DSS and performance measures application to ensure optimized operational level of service.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Parking Management</li> </ul>
<p><b>Improve Monitoring and Surveillance of Infrastructure</b></p>	<ul style="list-style-type: none"> <li>▪ Deploy additional technologies for surveillance and monitoring of infrastructure</li> <li>▪ Evaluate infrastructure after hurricanes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Unmanned Drones</li> </ul>

### 1.6.2. Integrated Corridor Management

ICM is an essential system for the operating agencies within the region to implement coordinated strategies to meet transportation performance measures and in response to recurring congestion and planned and unplanned traffic events causing congestion and/or delay. The ICM system will become the collective knowledge resource to select appropriate response plans either through an automated or human process and determine potential corridor benefits of proposed response plans. The ICMS is comprised of three main systems: 1) Response Plans, 2) Decision Support System, and 3) Performance Measures.

Based on the lessons learned from the Dallas and San Diego ICM Demonstration projects, we have partnered with Kapsch to provide expertise in ICM. Kevin Miller and Matt Juckes are recognized in the industry as the primary experts on Dallas and San Diego, and their knowledge will be used to manage this deployment.

As discussed later in our proposal, the Pinellas County implementation of ICM will provide USDOT with a regional non-Freeway based ICM deployment, which is more appropriate and transferable to small and medium sized cities in the US.

#### 1.6.2.1. Response Plans

The base set of Response Plan Sets will be developed for the initial population of the DSS. The plan sets will be developed for a set of incident scenarios based on the combination of attributes of the incident, including:

1. Event Location – There are 31 event locations being considered in both directions from intersection to intersection along the corridors.
2. Time of Day – The time of day is divided into the following time periods:
  - a. AM Peak Plans
  - b. PM Peak Plans
  - c. Off Peak Plans
3. Event Severity – the Event severity based on capacity reduction is also considered in the following:
  - a. Level 3 Severity – defined by full travel lane closure for any amount of time, or by one or more travel lanes closed for more than 120 minutes.
  - b. Level 2 Severity – defined by one or more travel lanes, but not all of them, closed between 30 minutes and 120 minutes.
  - c. Level 1 Severity – defined by one or more travel lanes, but not all of them, closed for fewer than 30 minutes.

The above attributes contribute to the combination of event scenarios which create a response plan set.

For each incident scenario, a response plan set will be developed which will utilize a combination of the following response plan elements below:

1. Existing detour routes defined by county/ city plans
2. Group of coordinated signal timing plans for a set of signalized intersections along the detour routes.
3. DMS signs and messages used by the existing MIST Software's event response plan generator and TMC Operator standard operating procedures.
4. Stakeholder Notification
5. Bus Routes impacted by the response plan

6. Traveler Mobility Elements
  - a. Park and Ride recommendations
  - b. Shuttle availability
  - c. Transit Recommendations

For the development of the Response Plan Sets, a document will be developed and provided to the stakeholders for review which indicates how the Response Plan Sets will utilize the existing timing plans from each traffic signal controller. It will also indicate the methodology for identifying potential signal timing plan gaps.

#### 1.6.2.2. Decision Support System

The DSS will be developed to provide a system to review and evaluate the current and predicted conditions of the Pinellas County transportation network to help operators make smart decisions in managing both recurring and non-recurring congestion conditions. Components to the DSS will include an Expert Rules Engine (ERE), a Predictive Engine (PRE), and an Evaluation Engine (EVE) that will build and select response plans to be evaluated, model the predicted outcomes of the selected response plans, evaluate and score the plans, coordinate with operators and local agency maintainers, and invoke the approved response plan actions. Once the system has deployed a response plan, the DSS will continue to monitor event status for changes and until the congestion has been alleviated so response plans can be modified or deactivated. The core responsibilities of the DSS are as follows:

- a. Monitor, evaluate, and respond to reoccurring congestion along the arterial networks.
- b. Evaluate and respond to non-recurring congestion on the study corridors within the identified network.
- c. Evaluate and respond to non-recurring congestion on arterial roadways within the identified network.

The main functionality of the ICMS is to:

- Receive live and historical data from traffic and transportation-related systems and operations in the region;
- Provide the status of devices and performance of roadway and transit network within the region of interest;
- Analyze infrastructure status data to determine the availability of infrastructure components and/or systems to use in corridor improvement strategies and response plans in the region;
- Analyze collected data to determine transportation performance, potential corridor improvement strategies, and responses to traffic events and congestion. Strategies and responses will include, but are not limited to:
  - Coordinated timing plan for central traffic signal software;
  - Dynamic messaging for diverting traffic;
  - Responder dispatch and coordination; and
  - Transit rerouting.
- Evaluate the potential benefit of implementing corridor improvement strategies and associated response plans through simulation in real-time and offline;
- Evaluate the impact of enacted corridor improvement strategies and associated response plans in real-time and offline;
- Provide stakeholders with the capability to provide and receive transportation-related data; and
- Present stakeholders with transportation-related analysis, and corridor improvement and response plan recommendations in an interactive real-time manner.

#### 1.6.2.3. Performance Measures System

Performance Measures, obtained via analytics and dashboards can be used to provide

important statistics that can help to detect and correct issues found within a transportation network. The Performance Measures system will provide analytics and graphical dashboards that will allow the regional stakeholders to view archived, statistical data related to the Region's transportation network.

The dashboards will contain support for multiple profiles corresponding to the multiple views and roles in the system ranging from seeing high-level status, to corridor level performance, to very detailed status of intersection data.



**Figure 9: Operational Dashboards**

### Operational Dashboards

The first level of dashboards are the operational dashboards that show current conditions within the county, potential incident locations, and status of the equipment.

### Supervisory Dashboards

Supervisory dashboards provide the operation's supervisors with indicators of things outside of historical norms. This may include levels of congestion, and volumes on certain roads for example.

## Executive Dashboards

Executive dashboards are provided to agency leads, and policy makers to show the high-level conditions of the transportation network in the County. This may include number of incidents, average speeds/ travel times within some corridors, and on-time transit percentages for example.

### 1.6.3. Pedestrian/ Intersection Connected Vehicle Technologies

Connected Vehicle information services empower users with timely and relevant regional transportation information for data driven route decisions. The information dispersion strategy for Connected Vehicle in this case is to provide Pedestrian Safety messaging, Intersection Collision warnings and SPAT messaging to Traffic Signals. Connected Vehicle dispersion are communications abstract and the distribution systems should accommodate multiple communication methods such as 5.9 GHz Dedicated Short Range Communication (DSRC), cellular, and traditional fixed roadside communications. Increasing the breadth and depth of information channels ensures regional information for commercial carriers is available and accessible at the time needed. Core services being provided as a part of PISCES promote mobility and safety compliance throughout the County. For the PISCES Project, up to 120 Roadside units and up to 50 Vehicle based units specifically for transit vehicles will be deployed along the two corridors in Pinellas County. Additionally, Signal Phase & Timing (SPaT) integration with the Econolite controllers will be deployed along corridors in the region,

### 1.6.4. Automated Vehicle Shuttles

Automated Vehicle Shuttles are shared transportation solutions dedicated to the last mile in an urban environment. These electric shuttles are dedicated to smart mobility and designed to cover short distances along

predefined routes in multi-use environments. For the PISCES Project, the EZ10 will be used for shuttles between parking facilities within the Clearwater Beach area, and Beach Drive in St. Petersburg.

EZ10 is an electric people mover. It can transport up to 12 people (6 seating positions and 6 standing positions) and can cater to reduced mobility passengers. The EZ10 includes a wheelchair ramp.

The shuttle has no steering wheel and neither dedicated front nor back. At any point on its route EZ10 can easily change its direction without needing a short turn.



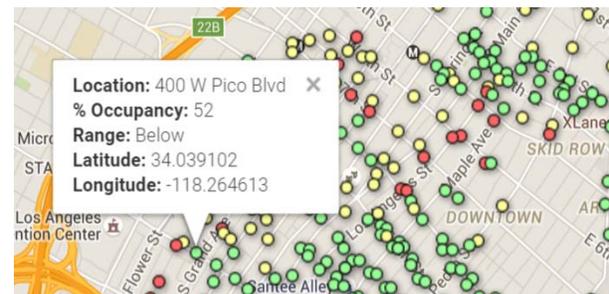
**Figure 10: Easy Mile Automated Vehicle Shuttles**

### 1.6.5. Parking Management

Today, Cities are actively generating a variety of parking and mobility data in their parking ecosystem such as meter and mobile payments, license plate recognition readings, GPS probe, connected car events, security camera data and more. Each of these datasets provides some insights into the City's curbside utilization. However, when analyzed separately they each have their own imperfections that provide an incomplete representation of actual demand.

Unfortunately, any single dataset does not provide a complete and accurate view. Based on previous experience there is value in

combining multiple datasets using sensor technology as a reference point, developing "Ground Truth." Our proposed solution is the Streetline Hybrid Smart Parking, a unique machine-learning analytics engine, sensor-lite infrastructure and suite of guidance products and services that is accessible via mobile and web interfaces. This technology will be custom-fit to St. Petersburg and Clearwater to effectively provide access to a continuous, comprehensive and accurate flow of occupancy data enabling the region to make informed and effective parking policy and demand management decisions. By providing parking data to travelers, studies have shown the potential to reduce congestion by up to 8% by reducing cars circling to find parking.



**Figure 11: Parking Status**

Utilizing the occupancy demand data generated by the Hybrid Platform, the region can access a range of mobile, web and tools to obtain a city-wide view of occupancy demand, optimize curbside utilization, make informed policy decisions and provide real-time guidance to available parking spaces and as such, take another step forward toward archiving the smart mobility concept.

### 1.6.6. Mobility on Demand Services

As defined by the ITS JPO - MOD is an innovative, user-focused approach which leverages emerging mobility services, integrated transit networks and operations, real time data, connected travelers, and cooperative Intelligent Transportation Systems (ITS). Which allows for a more traveler-centric, transportation system- of-systems approach, providing improved mobility options to all

travelers and users of the system in an efficient and safe manner.

For the PISCES project, we will leverage several existing products and projects, to include the Mobility on Demand Sandbox grant, the PSTA Direct Connect program which allows transit users to use Uber, United Taxi, and Wheelchair Transport at transit stops and regional trip planning websites to develop a one-stop Mobility Mobile Application for the region. The Mobile App will provide users with current traffic conditions, trip planning, connections to Direct Connect, AV shuttle routes and schedules, weather information, parking availability and event information.

### 1.6.7. Unmanned Drones

Due to some limitations on the existing CCTV network in the area, the PISCES project will deploy a couple unmanned drones during events to have a better view of traffic along the corridors in the region. In addition, the drones will be used for infrastructure inspections after hurricane and other large natural events that may impact the infrastructure. Due to the importance of the major bridge crossings in the region, the drones will be used for inspection of these facilities.

As required by USDOT and FAA regulations, the drones will be licensed with licensed operators.

## 1.7. Deployment Plan

This section describes some of the high-level tasks and considerations that will be addressed during the deployment of the PISCES project.

### 1.7.1. Deployment Sequencing

Once the planning and design phase of the project is completed, we expect the deployment of the components/ subsystems of the solution to be deployed in a logical and consistent manner.

Based on the Systems Integration experience of our team, we expect the Solutions described

in Section 1.6 to be deployed in the order shown in Figure 12 below.

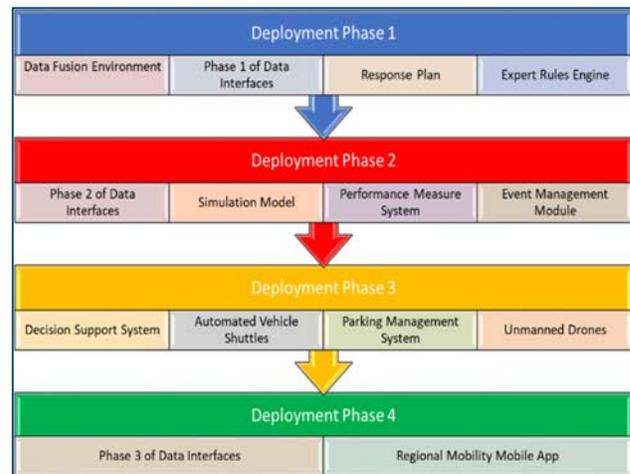


Figure 12: Deployment Sequencing

#### 1.7.1.1. Phase 1

Phase 1 will include the systems that are already well known and available from the systems integration team. The Data Fusion Environment will provide the databases that will be used by all the other systems. As discussed previously, Phase 1 of the Data Interfaces have already been developed and will be configured for this project. The Response Plan development will begin at this phase, and the rules engine will be created based on those rules.

#### 1.7.1.2. Phase 2

Phase 2 will focus on the additional Data Interfaces and deployment of the Aimsun Online model along with other components of the decision support system. The Performance Measures system will be deployed and the reports and dashboard work can begin. The Event Management Module will be configured to provide the notification and alerts to the agency stakeholders for coordination of response plans.

#### 1.7.1.3. Phase 3

Phase 3 is the final step in deployment of the decision support system with the integration and calibration of the components deployed in

Phases 1 and 2. The new technologies for the project will be deployed including the AV shuttles, the Parking Management System, and the unmanned drones. The management systems for these will be deployed so that the final data interfaces can be developed and deployed in Phase 4.

**1.7.1.4. Phase 4**

The final deployment phase of the project will include the data interfaces for the systems deployed in Phase 3, and the completion and deployment of the Mobile App.

**1.7.2. Operations and Maintenance**

It is anticipated that each agency will be tasked to operate and maintain the systems that are deployed within their jurisdiction and/or systems. The team will examine areas where it may be necessary for specific vendors to operate and maintain their systems for at least a start-up/shake down period. DPW and the Regional partners will work to ensure that any needed O&M funds are programmed onto the TIP as this project advances. The following table provides additional details

**Table 1-5: Long-Term Maintenance**

System	Proposed Maintainer
<b>Data Fusion Environment</b>	Pinellas County Department of Public Works
<b>Data Interfaces</b>	Pinellas County Department of Public Works
<b>AV Shuttle</b>	Pinellas Suncoast Transit Authority
<b>Integrated Corridor Management System</b>	Pinellas County Department of Public Works
<b>V2X RSUs</b>	Pinellas County Department of Public Works and FDOT
<b>V2X OBU's</b>	Pinellas Suncoast Transit Authority
<b>Parking Management System</b>	City of Clearwater, City of St. Petersburg
<b>Unmanned Drones</b>	Pinellas County Department of Public Works
<b>Mobile Application</b>	Pinellas County Department of Public Works

**1.8. Challenges**

There are no significant obstacles to deployment and certainly no insurmountable ones. The Regional Stakeholders support the PISCES Project. The 2006 County Inter-Local Agreement for ATMS/ITS/Signals gives Pinellas County authority to deploy the PISCES Project. The Pinellas County share of the funding is in place through the TIP, STIP, MPO Long Range Plan and Florida Long Range Plan. Connected and automated vehicle

technology is supported in Florida by several statutes.

Pinellas County has passed one regulatory hurdle in CV application by securing the 5.9GHz FCC licensing from the state and federal governments. Anticipated institutional/other challenges include:

- Overall coordination of the large set of agency stakeholders;

- Development and implementation of an explicit O&M Plan acceptable to all members;
- Integration of the wide variety of legacy systems;
- Technology system changes/advancement during the life of the project; and
- Maintaining a realistic schedule.

## 1.9. Performance Improvement

System performance is a result of the various projects that support the goals of the study. The following system performance improvements are expected because of the project elements identified in the proposal.

### 1.9.1. Measured improvements in Regional incident response performance measures

By gathering traffic data into a real-time dynamic visualization approach, the Pinellas County Region will be able to optimize and improve traffic using data-driven decision support for proactive response to incidents & events.

DPW and its partner agencies will see significant performance improvements for event management and response, including alarm and incident detection, and the status of action/response plans. This means that working with partner agencies, collaborative, proactive traffic management is now possible allowing for greater speed in event clearance, traffic mitigation and recovery, including the potential to modify construction schedules in the event traffic conditions warrant a change to pre-authorized lane closures.

### 1.9.2. Measured improvements in trip reliability measures

ICM implementation on key corridors will result in improved trip reliability for both automobile and transit travelers. Improved situational awareness from the ICM system,

coordinated response plans enabled by the DSS, actionable information will lead to travel times becoming more reliable (as measured by travel reliability indicators, buffer, planning time indices for car and transit schedule adherence.)

### 1.9.3. Measured improvements in person throughput on key corridors

Similarly, ICM implementation on key corridors will result in optimizing networks leading multi-modal corridor performance measured by person throughput, particularly in high travel demand and/or reduced capacity periods.

### 1.9.4. Measured improvements in overall traveler safety

Safety performance measures to evaluate the safety benefits to the Region including overall crash rate, fatality and injury rates. Indirect measures including vehicle speeds, speed variability, the number of traffic violations, percentage reduction in rescue response time and public perceptions will also be considered.

## 1.10. Safety, Mobility, and Environmental Benefits

Based on the expected system performance measurements, the following key outcome performance indicators are identified for our project. These measures will be further defined as part of the evaluation task along with the data collection and management approach. Other input, output related performance measures will also be defined. For example, the team will assess the improvements to situational awareness, the use of the DSS and the effectiveness of the CV applications that are proposed as part of the pilot. However, measures of effectiveness for input and outputs are not presented in the table below due to page limit restrictions.

Table 1-6: Key outcome-related performance measures

Performance Area	Description	Key Performance Measures (Targets)
<b>PISCES will provide the following Safety benefits:</b>		
<b>Safety</b>	The Region will realize an improved overall safety outcome, through better incident management and utilizing connected vehicle technologies thereby reducing the occurrence of secondary crashes.	Reduction of Pedestrian-Related Crashes across the Region (5%) Reduction in the number of secondary incidents in corridors where CV technology is implemented (5%)
<b>PISCES will provide the following Mobility benefits:</b>		
<b>Improved Special Event Management</b>	Operating agencies within the Region will improve management practices and coordinate decision-making, resulting in enhanced response and control.	Reduction of total response time to incidents reduced across the Region (5%) Reduction of incident clearance times across the Region (5%)
<b>Better Inform Travelers</b>	Travelers will have actionable multi-modal (highway, arterial, transit, parking, etc.) information resulting in more personally efficient mode, time of trip start, and route decisions especially during high-demand and capacity constrained times	Improvement in planning time index and buffer time index for key facilities (Target TBD) Improvement in transit on-time performance in the ICM corridors (Target TBD)
<b>Improve Corridor Performance</b>	Optimizing networks at the corridor level will result in an improvement to multi-modal corridor performance, particularly in high travel demand and/or reduced capacity periods.	Increased Person throughput on ICM corridors (Target TBD)
<b>Reduce Congestion</b>	Providing improved mobility information, especially Parking Availability will reduce congestion	Reduction in congestion in CBD (3%)

### 1.10.1. Safety Benefits

The impact of this project on Safety will be evaluated to ensure that the systems deployed and the management strategies used will have a positive direct and measurable effect on the Region. This project will consider several safety performance measures to evaluate the safety benefits to the Region including overall

crash rate, fatality and injury rates. Indirect measures including vehicle speeds, speed variability, the number of traffic violations, percentage reduction in rescue response time and public perceptions will also be considered.

### 1.10.2. Mobility Benefits

The actual impact of improved traveler information, coordinated incident response, and many of the strategies we are proposing on mobility includes several key performance measures. This includes travel time reliability for both freight and commuters in the Region; better managing capacity across modes by utilizing ICM strategies; informing travelers of the travel time of routes so that trips can be postponed or alternate routes can be taken thereby decreasing travel demand and improving travel time reliability. As part of the evaluation of the project, we will consider several of the key performance measures previously mentioned including freight travel time reliability and mileage of uncongested routes.

### 1.10.3. Environmental Benefits

Transportation is a major contributor of CO<sub>2</sub> and other greenhouse gas emissions from human activity, accounting for approximately 14 percent of total anthropogenic emissions globally and about 27 percent in the U.S. Fortunately, transportation technologies and strategies are emerging that can help to meet the climate challenge. These include automotive and fuel technologies, intelligent transportation systems (ITS), and mobility management strategies that can reduce the demand for private vehicles. While the climate change benefits of innovative engine and vehicle technologies are relatively well understood, there are fewer studies available on the energy and emission impacts of ITS and mobility management strategies. In the future, ITS and mobility management will likely play a greater role in reducing fuel consumption. Studies are often based on simulation modes, scenarios analysis, and limited deployment experience.

A 2013 study estimated that integrated corridor management projects in San Diego, Dallas and Minneapolis would lead to annual fuel savings of 323,000, 981,000, and 17,600 gallons,

respectively, correlating to 6 million, 17.6 million, and 316,800 lbs. of annual CO<sub>2</sub> reductions for the three sites.

### 1.11. Partnership Plan

The following private companies have partnered with the County for this project:

- **KAPSCH TrafficCom Transportation (KTT)** – KTT is currently under contract with Pinellas County as part of the GEC On-Call agreement. KTT maintains the MIST ATMS software platform used by DPW. KTT will be our overall consultant lead in charge of project management, system integration, deployment and O&M services
- **Streetline** – Streetline will provide a real-time parking management application in the County specifically in the Clearwater and St. Petersburg areas.
- **DTN** – DTN will integrate available real-time weather sources of data to provide the Region with the real-time and forecasting weather conditions and weather alerts, which will be critical during special events and Hurricane Evacuation.
- **HERE** – The Region as part of the statewide FDOT agreement with HERE has access to real-time data on facilities within the county. HERE will provide additional data to cover the local streets. HERE will also provide a routing application that will enable the DSS application and travelers to select the best routes for their destinations.
- **WAZE** - The Region as part of the statewide FDOT agreement with WAZE has access to real-time data on facilities within the county
- **CUTR** – The University of South Florida’s Center for Urban Transportation Research will provide evaluation services for the project.
- **UBER** – PSTA has entered an agreement with UBER to provide first mile / last mile services

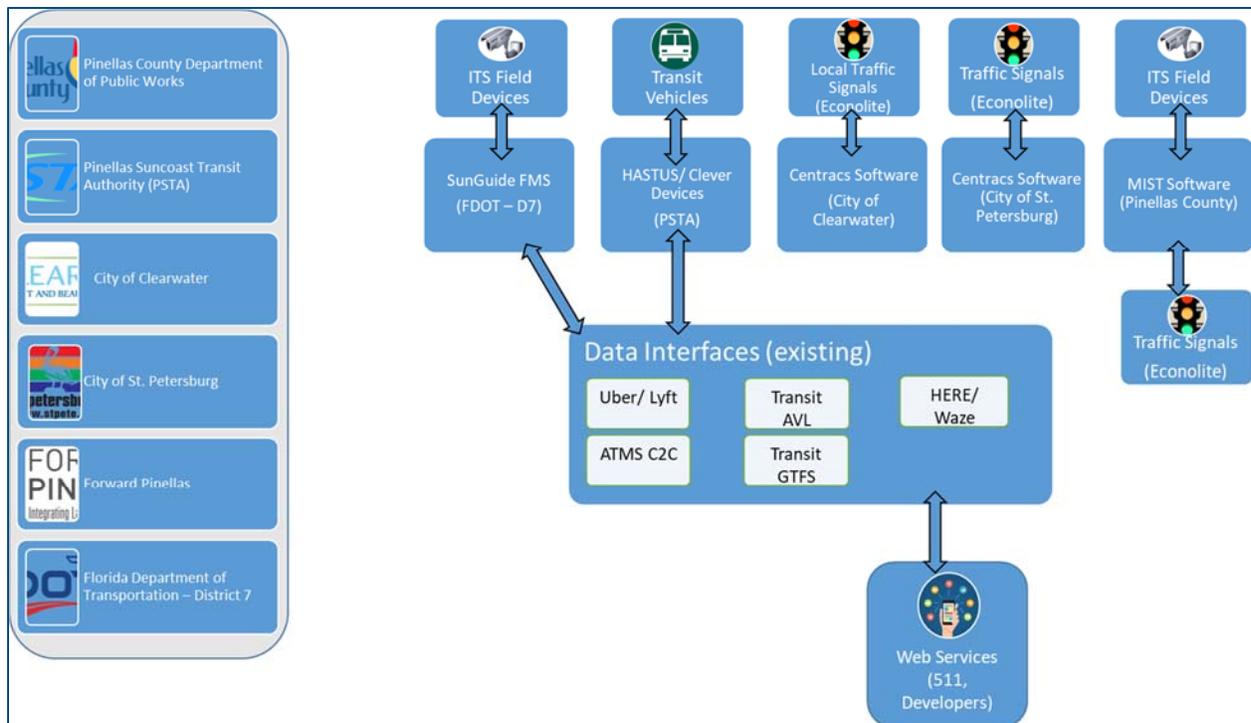


Figure 13: Existing Systems Deployed in the Pinellas County Region

### 1.12. Leverage Existing Investments

The Region has many investments by the local, state, and federal government to ensure travelers move efficiently and reliably within the Region. Pinellas County agencies have extensive investment in ITS ATMS/ATIS incident management and advanced traffic control, as partially shown in Figure 13.

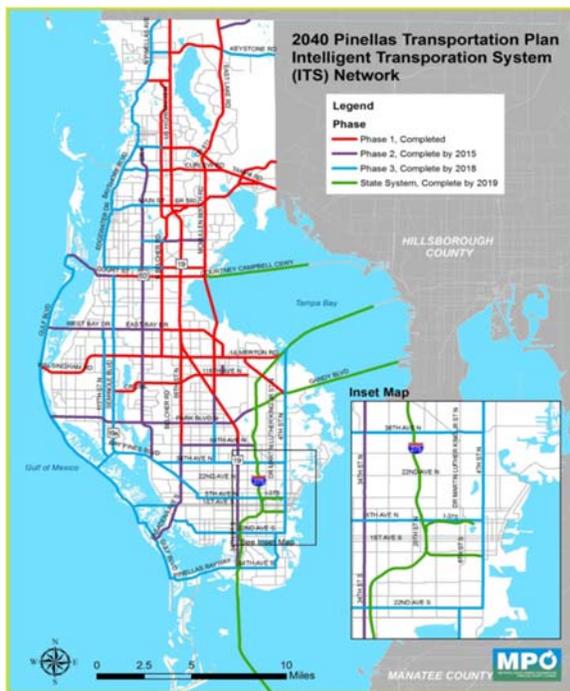
Today, Pinellas County DPW has 54 dynamic message signs along roadways that alert drivers of upcoming incidents and allow them to make better route decisions. Traffic controllers in the Pinellas Primary Control Center monitor traffic in real time using 132 video cameras that are installed at selected intersections which allow them to activate dynamic message signs promptly. Of the 801 traffic signals in Pinellas County, 191 are managed by adaptive control systems that can automatically adjust and coordinate signal timing to improve traffic flow along critical corridors.

With the approval of a one cent gas tax dedicated to ATMS/ITS improvements and the leveraging of federal and state grants, most major roadways in Pinellas County are scheduled to have some form of ITS application installed on them by the end of the decade. Once completed the gas tax will be used for long term management and operational of the system as well as any new projects for system improvements.

The transportation projects scheduled over the next five years (2015–2019) are listed in the MPO’s Transportation Improvement Program (TIP). These projects previously were prioritized through the long-range planning process and are now funded by various implementing agencies including FDOT, Pinellas County, and cities within the county.

Figure 14 illustrates the State and County roads on which technology is being used to help address congestion and the flow of traffic. Divided into three phases, the Pinellas County

Intelligent Transportation Systems network, along with the projects funded by the State, will be completed by 2019.



**Figure 14: Planned ITS Network**

The Pinellas Suncoast Transit Authority (PSTA) is the public transit provider in Pinellas County, Florida, providing more than 14.4 million rides a year. 187 buses serve 5,368 bus stops on 40 routes in Pinellas County including two express routes that travel to Tampa. In recent years, PSTA has developed mobility services which will be leveraged for the PISCES project. The Mobility on Demand Sandbox project provides Paratransit services to include Uber and LYFT as options for customers. The Direct Connect services provides options for travelers to use Uber, United Taxi, and Wheelchair Transport from transit stops in the region.

Pinellas County Intelligent Transportation System (ITS) infrastructure, SmartTracs, is comprised of various technologies used to monitor traffic conditions and provide real-time information to travelers throughout the County. Pinellas County DPW manages a 24/7 centralized operations center and controls over traffic signals, CCTV, and DMS.

Closed Circuit Television (CCTV) cameras allow operators from the DPW operations center to monitor traffic conditions throughout the County. Dynamic Message Signs (DMS) are used to provide travelers with information on current traffic conditions within the County. Messages displayed on DMS include information on incidents, construction events, travel times, weather conditions and special events.

Travel times to the beach are also displayed on specific DMS signs as travelers enter Pinellas County across the Causeway.

FDOT D7 uses SunGuide software to manage the ITS infrastructure installed along the Interstate routes within the County. FDOT manages a 24/7 centralized operations center and controls over Safety Service Patrols, CCTV, and DMS.

FDOT also provides a statewide 511 system that will be leveraged to inform travelers of the conditions and special events in the region. The PSTA currently provides route and schedule information, trip planning, Where's My Bus information, and travelers can sign up to receive personalized alerts and notifications on PSTA services through the PSTA website.

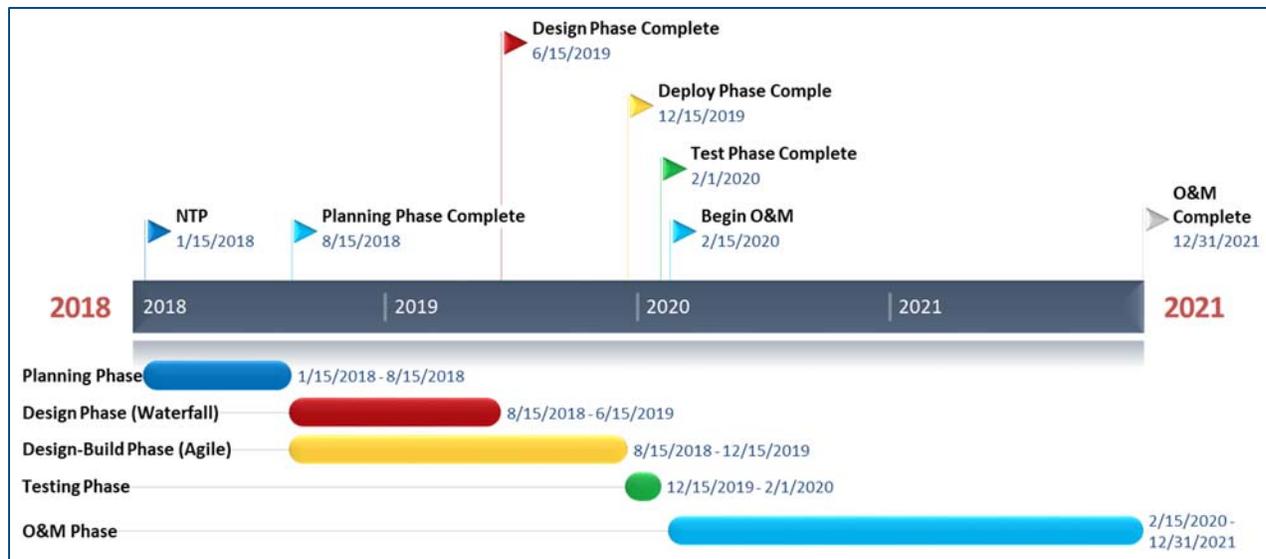


Figure 15: Proposed High-Level Schedule

### 1.13. Schedule

We are proposing a 4-year schedule, with a 24-month planning/design/build phase followed by a 24-month Operations and Maintenance phase.

#### 1.13.1. Phase 1: Planning Phase

For the planning phase of the project, a Concept of Operations document and Requirements document will be the primary deliverables. Following the FHWA Systems Engineering process, a Project Management Plan (PMP) and Systems Engineering Management Plan (SEMP) will also be provided.

#### 1.13.2. Phase 2: Design Phase

Our experience has shown that a hybrid waterfall and agile process is appropriate for projects which have well know elements and less known elements. For this phase, the well-defined elements which our Systems Integrator has previous experience deploying will be identified and designed. This phase will also identify the elements which will be design & developed during the Agile Deployment phase. All elements designed during the Design phase 1 will be developed during the Phase 3 integration build.

#### 1.13.3. Phase 3: Design-Build Phase (Agile Deployment)

Since some of the data used for the system will be new, an agile development process will be followed. We currently expect three iterations of the build to be designed, prior to a final Integration build which will be used for the Systems Acceptance Test (SAT). Our goal is to have an operational system within 18 months after the planning phase is complete.

#### 1.13.4. Phase 4: Testing and System Acceptance

Testing is an activity embedded as an integral part of our software and system development methodology as well as final deployment and start of operations. Implementation includes unit coding, unit testing, unit integration, and integration testing. The final step in testing, once the Unit and Integration testing is complete is the System Acceptance Testing (SAT). The SAT plan and scripts will be developed by the consultant team, and reviewed and approved by the stakeholders. The SAT will be completed by a group identified by the stakeholders to test the system and “accept” it for operations.

### 1.13.5. Phase 5: Operations and Maintenance Phase

Following the ICM program's model, we are proposing a 6-month "soft launch" of the system to test and modify the operational processes prior to a 12-month full O&M phase.

## 1.14. Support of USDOT ITS Initiatives

The PISCES project will support the ITS JPO's mission to Conduct an ongoing intelligent transportation system program to research, develop, and operationally test intelligent transportation systems and to provide technical assistance in the nationwide application of those systems as a component of the surface transportation systems of the United States.

### 1.14.1. Accelerating Deployment

Through testing of new technologies and operational strategies, the PISCES project will assist USDOT with this research area. Pinellas County will assist USDOT through lessons learned from this deployment and providing USDOT with support of these activities.

### 1.14.2. Automation

Automated vehicles are those in which at least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input. Automation has the potential to significantly impact our driving safety, personal mobility, energy consumption, operating efficiency, environmental sustainability, and land use. PISCES will deploy automated vehicle shuttles for this project which can assist USDOT with further research on feasibility, identification of issues, and public acceptance of AV technology.

### 1.14.3. Connected Vehicles

Connected Vehicle Program works with state and local transportation agencies, vehicle and device makers, and the public to test and evaluate technology that will enable cars,

buses, trucks, trains, roads and other infrastructure, and our smartphones and other devices to "talk" to one another. For the PISCES project, we will deploy several technologies to support the USDOT initiative to include deployment of Roadside Units (RSU) and On-board Units (OBU) to test deployment of safety applications.

### 1.14.4. Emerging Capabilities

The PISCES project will demonstrate the use of several new and innovative technologies that will support the USDOT effort in identifying new technologies and practices that we believe will improve the transportation services within the County.

### 1.14.5. Enterprise Data

The basic building blocks of the PISCES Project is data, through the development of our Data Warehouse and Data Mart we will integrate large amounts of data that are already generated by many of the systems within the county, but are not currently fully utilized. Using the Decision Support System, the Performance Measures, the Mobility Mobile App, and the Data Mart Data Feed the agencies, travelers and developers will have access to this large data set being developed through the Data Fusion Environment.

### 1.14.6. Interoperability

The PISCES Project will ensure effective connectivity among devices and systems. Most the systems deployed and data integrated for PISCES will use ITS and industry standards to ensure interoperability. Beginning with the data interfaces, we will use Center-to-Center and TMDD standards where appropriate. Transit Route and Schedule data is provided using the GTFS standard. Our Data Mart Data Feed will be an XML based system that will allow developers to easily consume the data provided for development of their own applications and systems.



## 2.2. Primary Point of Contact

The primary point-of-contact for our proposal is:

**Ken Jacobs**

Transportation Division Director  
Pinellas County Department of Public Works  
22211 U.S. 19 N.  
Clearwater, FL 33765  
(727) 464-8928  
kjacobs@pinellascounty.org

## Appendix A: Resumes

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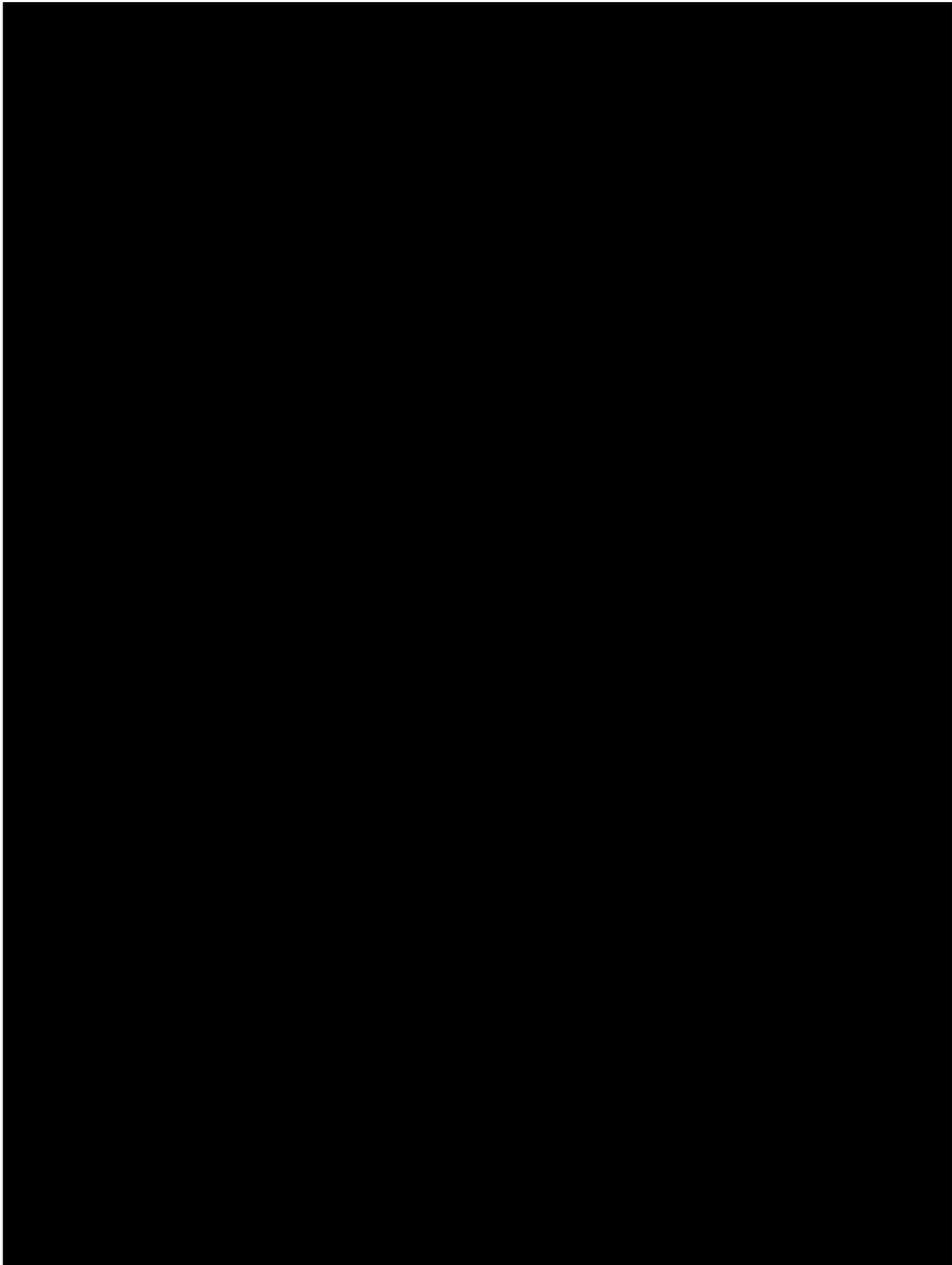
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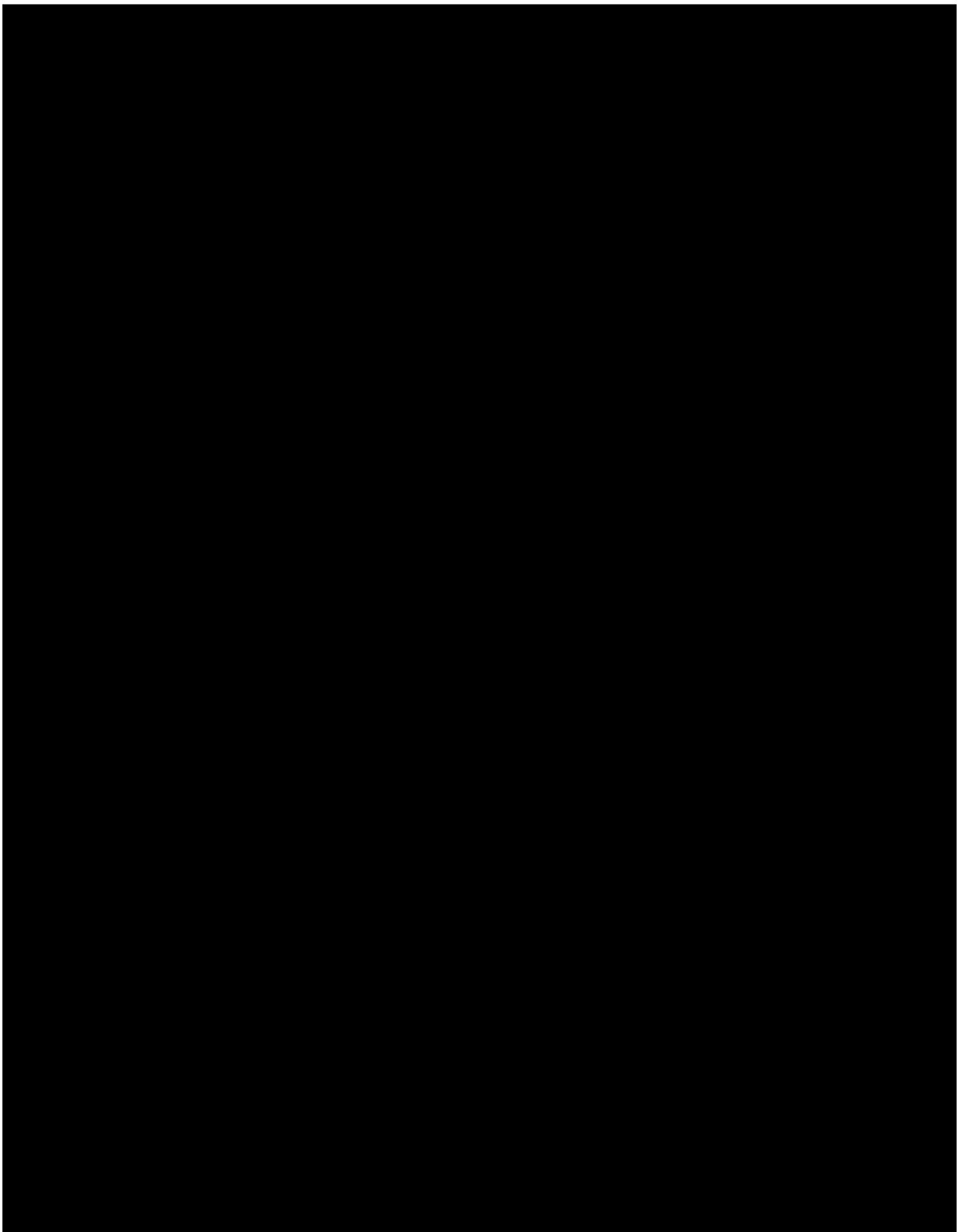
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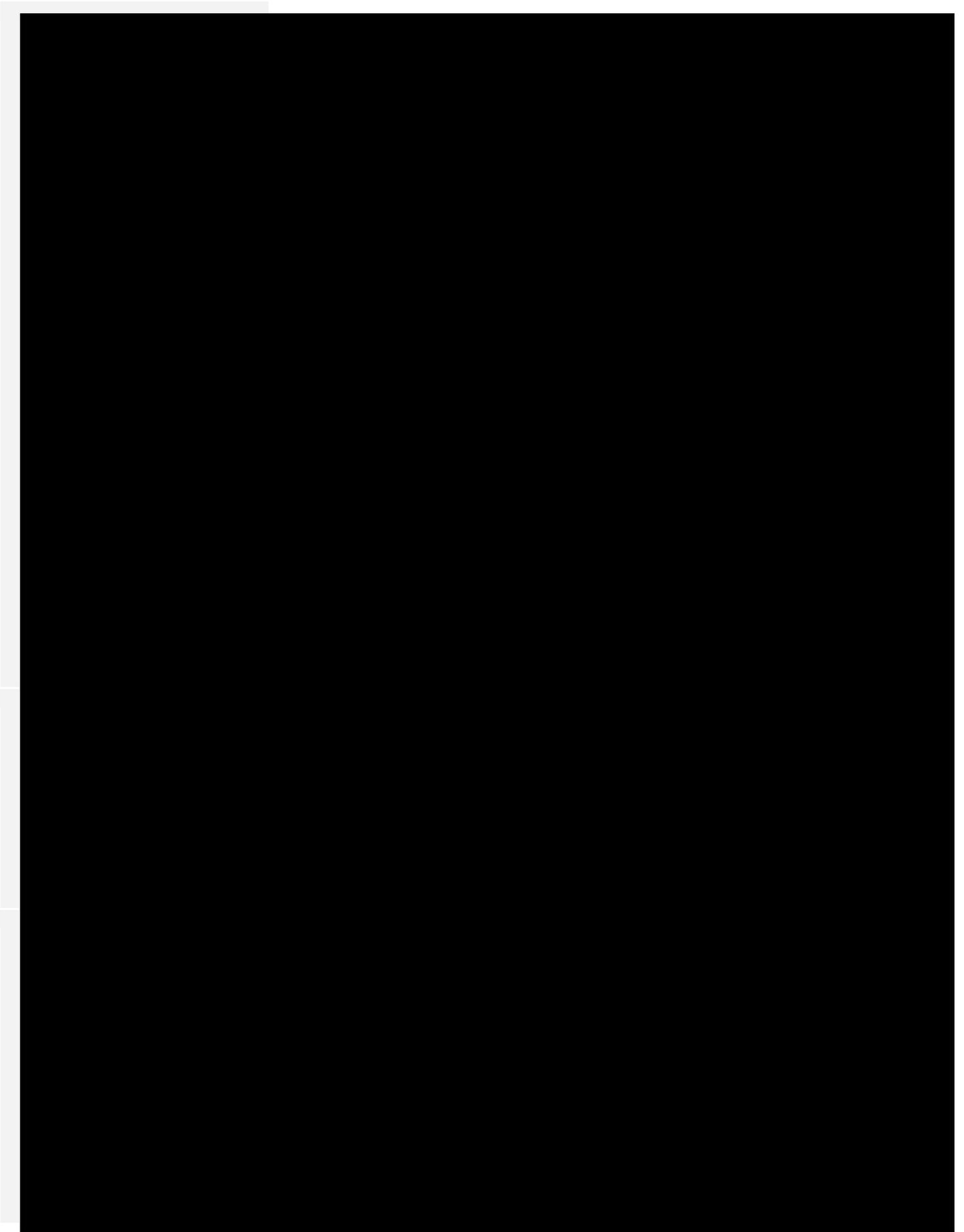
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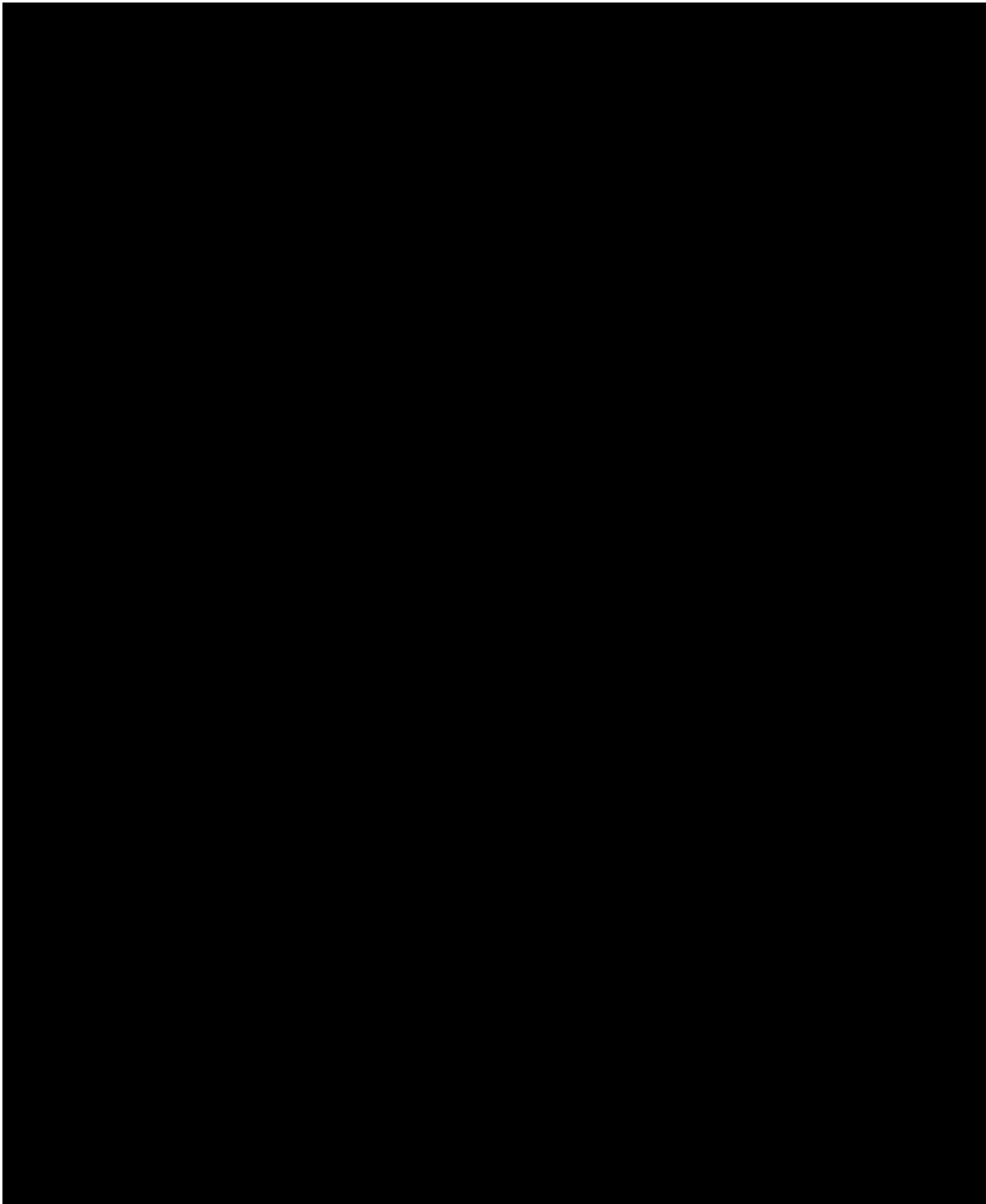


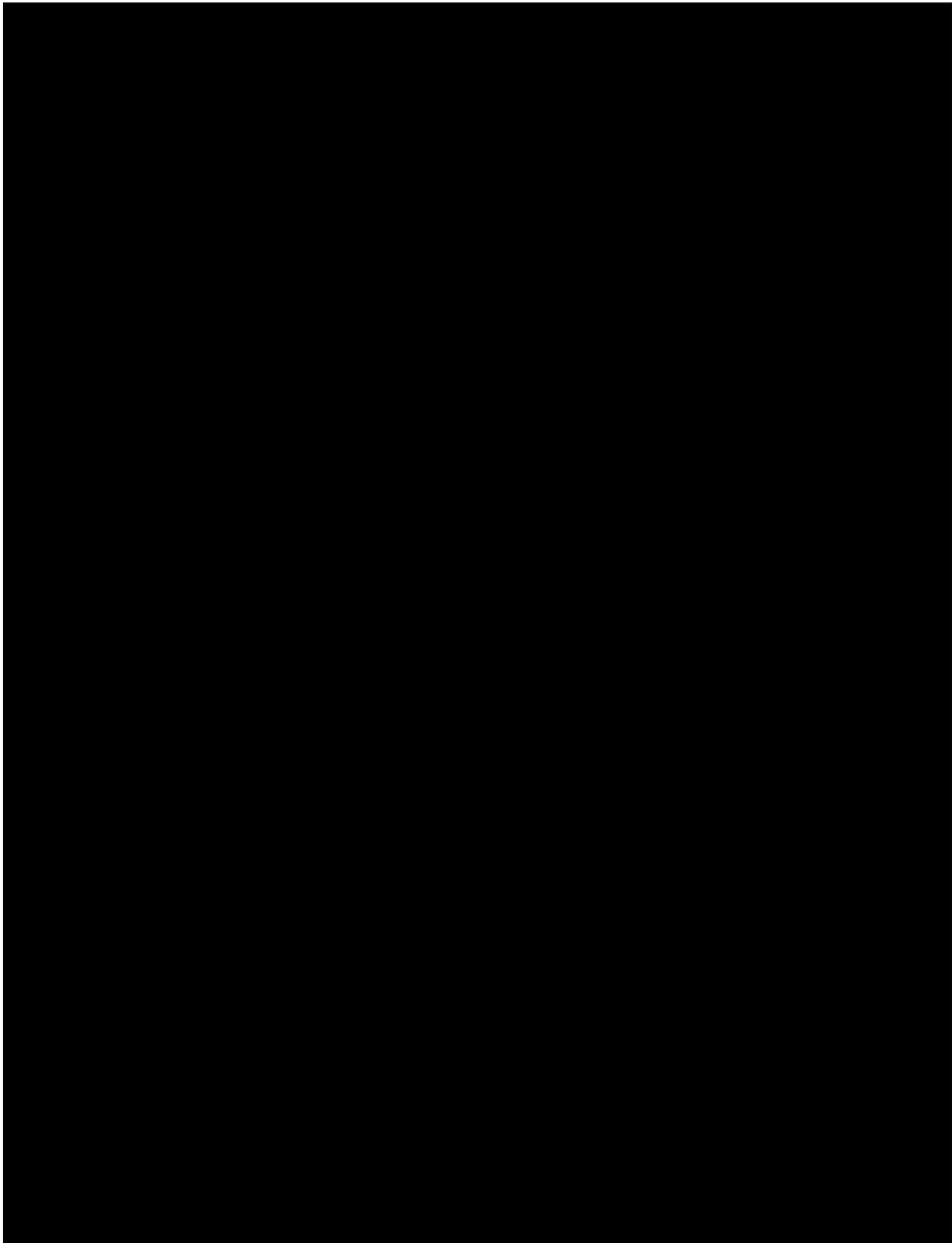
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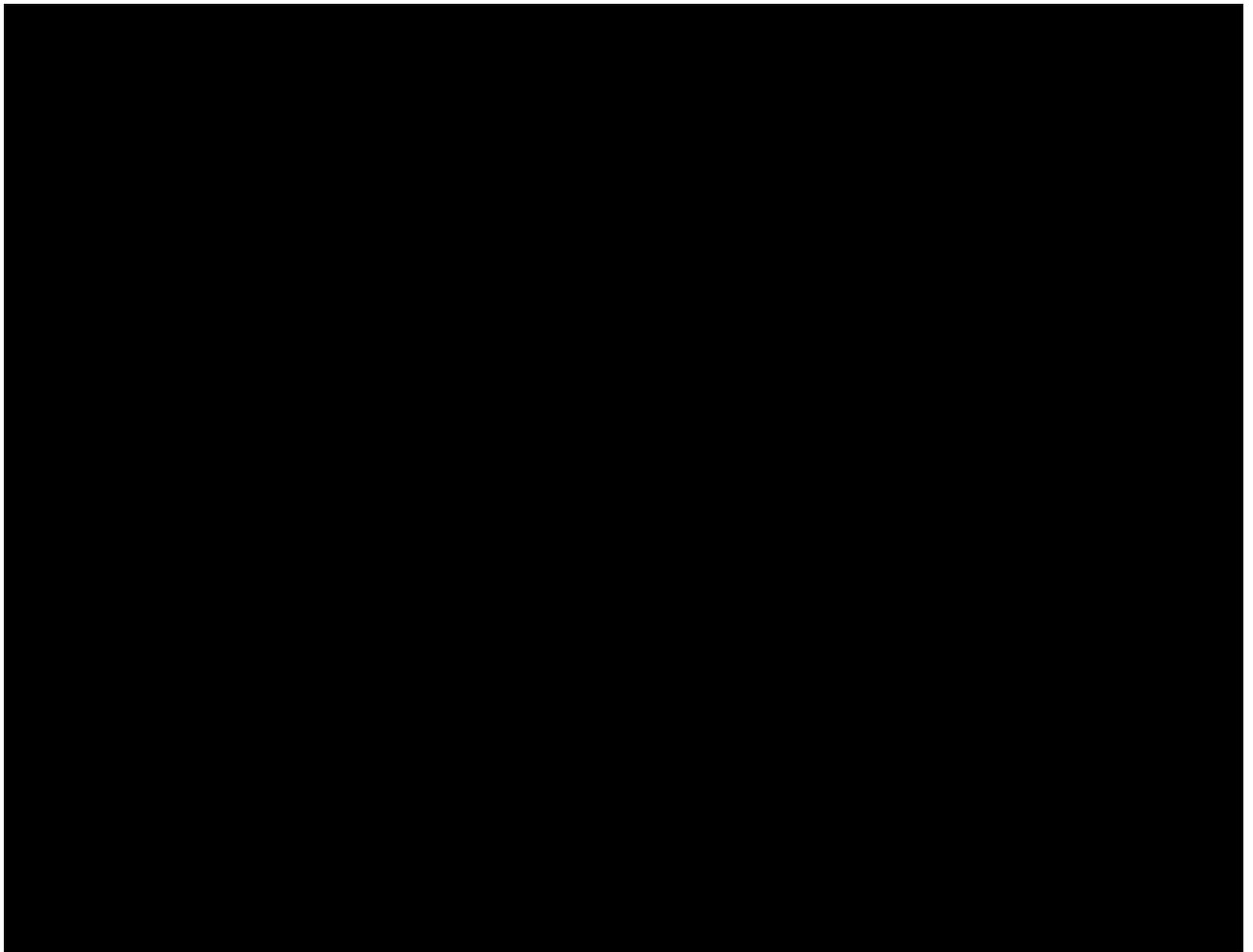
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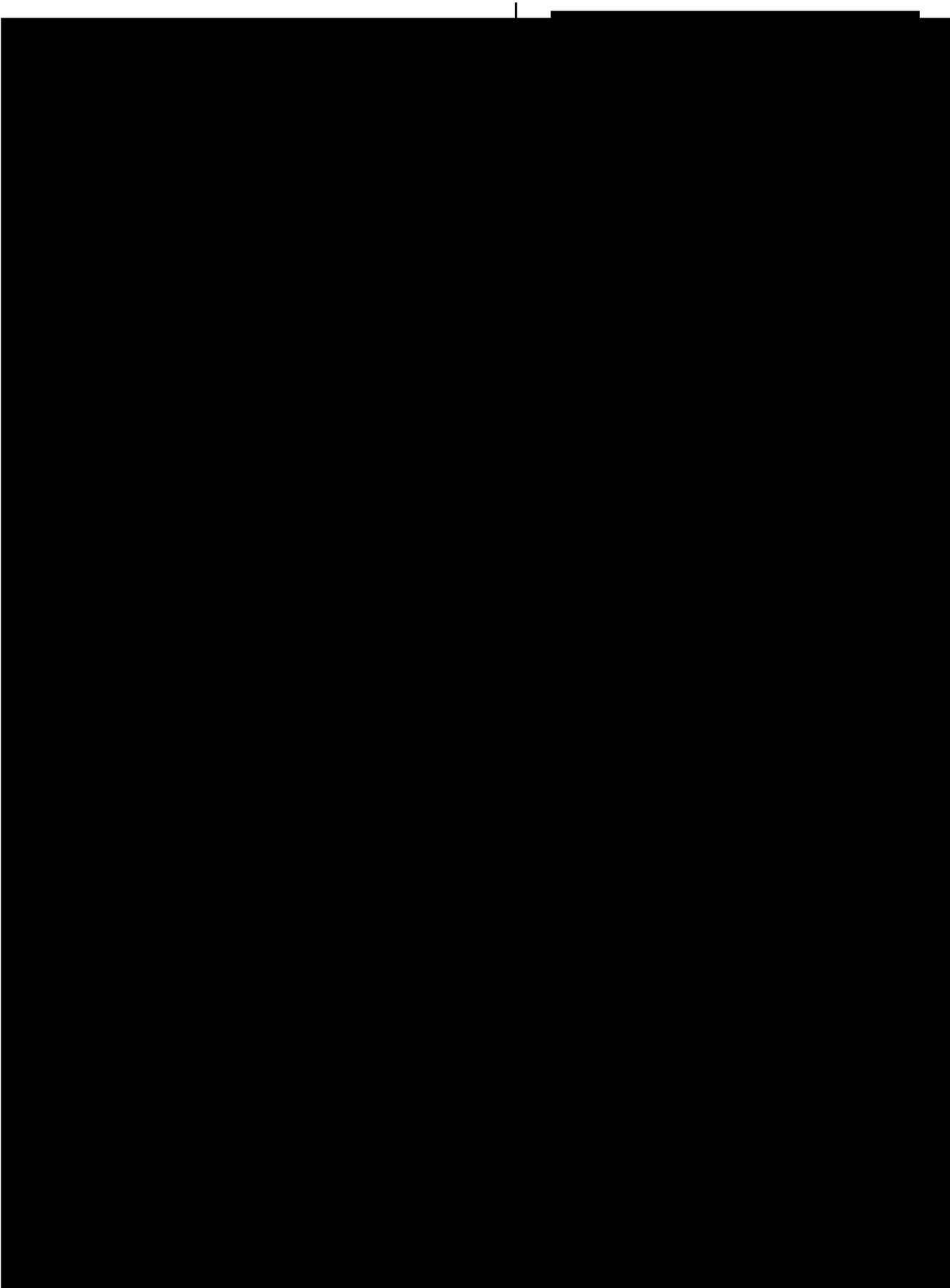


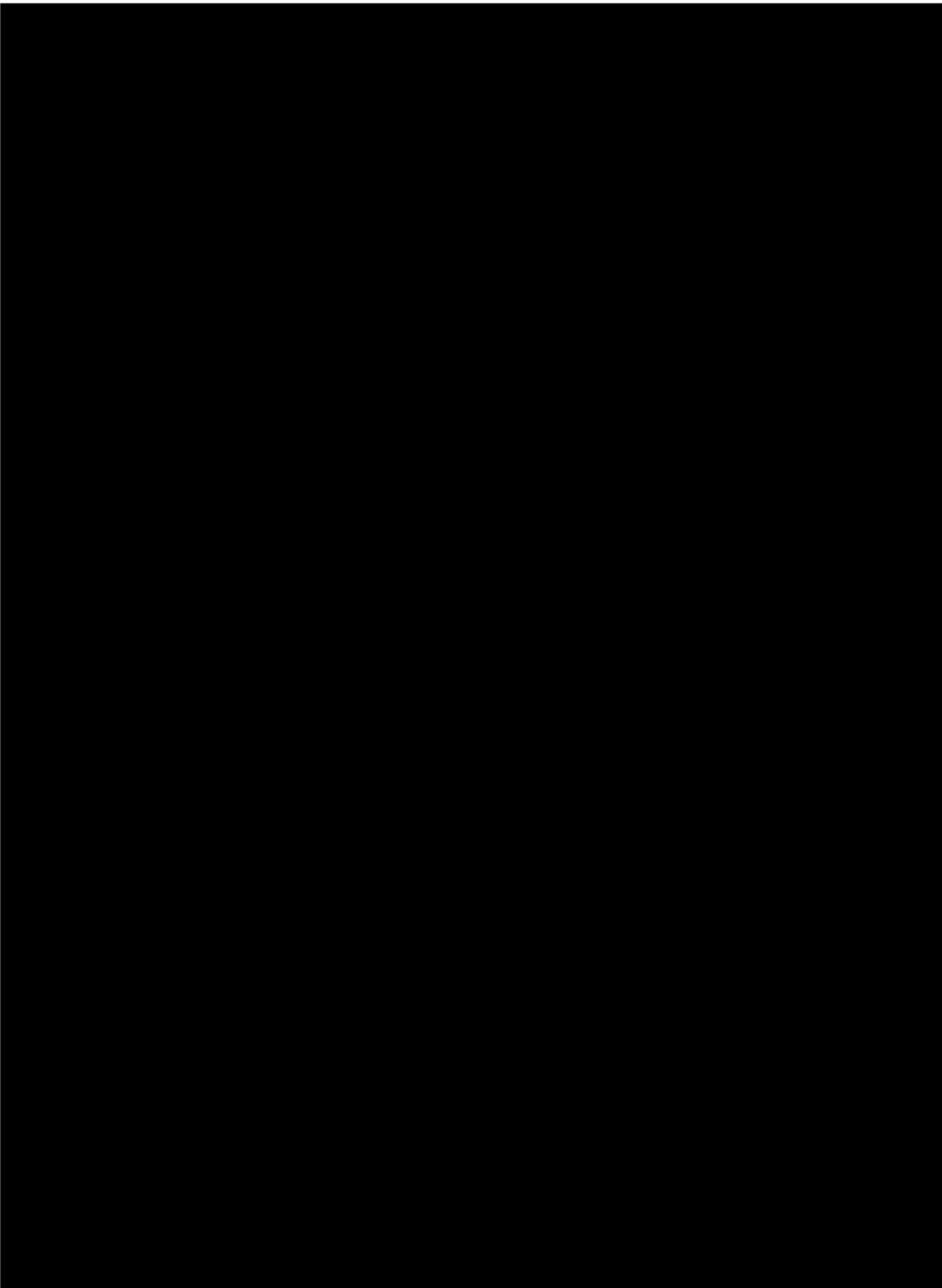


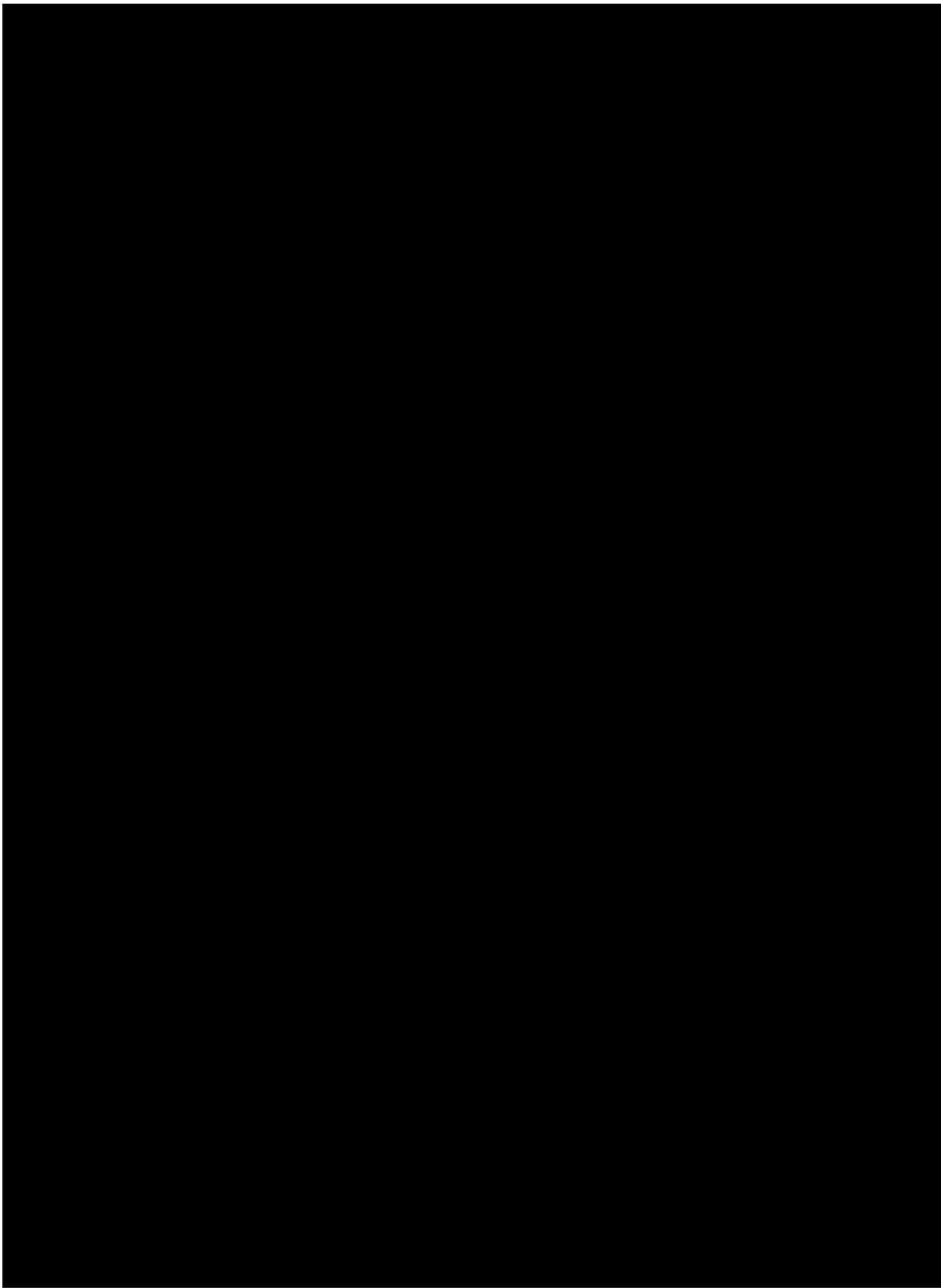


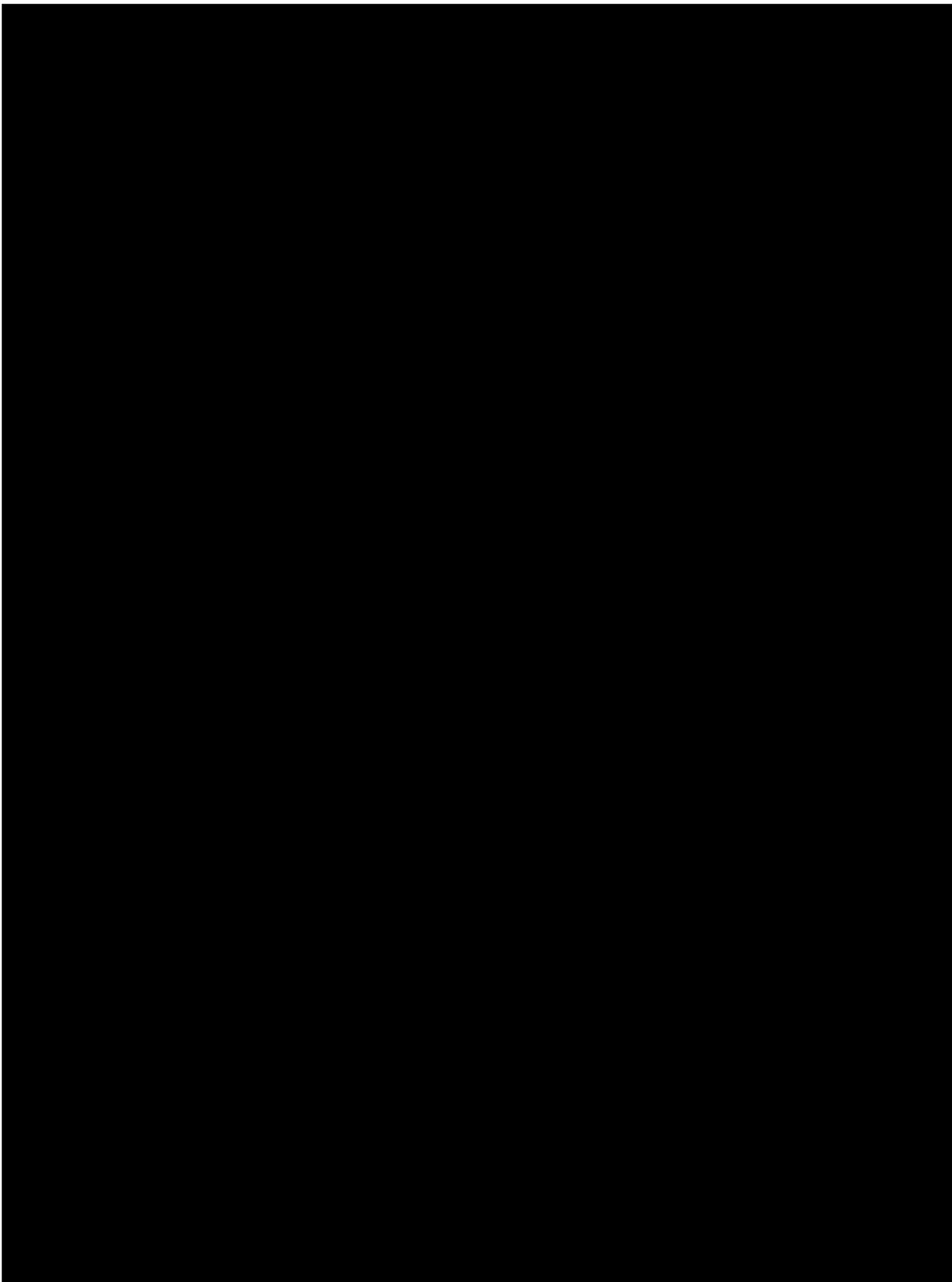














## Appendix B: Letters of Support





# THE FLORIDA SENATE

Tallahassee, Florida 32399-1100

**COMMITTEES:**  
Appropriations Subcommittee on  
Transportation, Tourism, and Economic  
Development, *Chair*  
Appropriations  
Community Affairs  
Criminal Justice  
Regulated Industries  
Rules

**SENATOR JEFF BRANDES**

24th District

June 9, 2017

U.S. Department of Transportation (USDOT)  
Federal Highway Administration (FHWA)  
Office of Acquisition and Grants Management  
1200 New Jersey Avenue, SE  
Mail Drop: E62-204. Washington DC 20590

Re: Advanced Transportation and Congestion Management Technologies Deployment Initiatives  
Funding Opportunity Number DTFH6116RA00012

Dear Office of Acquisition and Grants Management,

As Chairman of the Florida Senate's Appropriations Subcommittee on Transportation, Tourism, and Economic Development and sponsor of State legislation supporting innovative transportation technologies, I would like to provide my support of Pinellas County Department of Public Work's proposal; on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment Initiative" funding request.

I see immense value in Pinellas County Region advancing its current deployment of technologies and gaining insights from areas throughout the County to deploy "next gen" technologies and utilize strategies for special event management. They have established varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives and are managing the extreme fluctuations of traffic in the region during Spring Break and during other special events. The Pinellas County grant applications' focus is to facilitate advanced technologies for special event management. Collaborative inputs for implementation and sustainability will be further refined with stakeholders to ensure the best and highest uses of new technologies are installed to improve movement of people and goods within Pinellas County.

I would appreciate your favorable consideration of this multi-agency collaboration with Pinellas County, Florida Department of Transportation, and its partners to address the growing needs of the motoring public in the State of Florida.

Kind Regards,

A handwritten signature in black ink, appearing to read "Jeff Brandes".

Jeff Brandes

REPLY TO:

- 9800 4th Street North, Suite 200, St. Petersburg, Florida 33702 (727) 563-2100
- 416 Senate Office Building, 404 South Monroe Street, Tallahassee, Florida 32399-1100 (850) 487-5024

Senate's Website: [www.flsenate.gov](http://www.flsenate.gov)

**JOE NEGRON**  
President of the Senate

**ANITERE FLORES**  
President Pro Tempore

June 12, 2017

Advanced Transportation and Congestion Management Technologies Deployment Initiatives  
Funding Opportunity Number DTFH6116RA00012  
U.S. Department of Transportation (USDOT)  
Federal Highway Administration (FHWA)  
Office of Acquisition and Grants Management  
1200 New Jersey Avenue, SE  
Mail Drop: E62-204. Washington DC 20590

The Pinellas Suncoast Transit Authority (PSTA) strongly supports the Pinellas County Department of Public Works (DPW) proposal on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative" funding opportunity. The Pinellas County Region is well prepared to advance deployment of technologies in the region and to leverage lessons learned from other areas of the country to improve special event management.

While PSTA already partners with local jurisdictions to facilitate mobility during special events, we are also committed to working with Pinellas County to implement new technologies for special event management as described in the application. PSTA looks forward to working with DPW and other partners to further refine details of the implementation and sustainability plan to ensure that the new technologies are installed in a way that creates the greatest public benefit.

The Pinellas County region is already well positioned as evidenced by:

- The partnerships and foundations that have been established through the development of varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives that have been or are being deployed by various Pinellas County region agencies and other entities, including PSTA.
- The leadership of Forward Pinellas, the metropolitan planning organization for the Pinellas County region in establishing a long-term framework for the deployment of critical ITS infrastructure and innovative mobility projects.
- The experience of the Pinellas Region in managing the severe fluctuations of traffic in the region during Spring Break and during other special events. Due to this experience, we understand the technologies that can be leveraged to most effectively and efficiently improve the movement of people and goods within the County.

I would appreciate your favorable consideration of this multi-agency collaborative endeavor. PSTA is fully committed and excited to work with DPW and its partners to develop these innovative technology concepts and ultimately move forward with implementation.

Sincerely,

A handwritten signature in black ink, appearing to read "Brad Miller", is written over a light blue horizontal line.

Brad Miller, CEO



*Florida Department of Transportation*

RICK SCOTT  
GOVERNOR

11201 N. McKinley Drive  
Tampa, FL 33612-6456

RACHEL D. CONE  
INTERIM SECRETARY

June 12, 2017

Advanced Transportation and Congestion Management Technologies Deployment Initiatives  
Funding Opportunity Number DTFH6116RA00012  
U.S. Department of Transportation (USDOT)  
Federal Highway Administration (FHWA)  
Office of Acquisition and Grants Management  
1200 New Jersey Avenue, SE  
Mail Drop: E62-204. Washington DC 20590

Dear Sir or Madam:

The **Florida Department of Transportation (FDOT), District 7** is submitting this letter of support for the Pinellas County Department of Public Work's (DPW) proposal on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative" funding opportunity. The Pinellas County Region has all the ideal attributes to advance deployment of technologies in the region and leverage lessons learned from other areas of the Nation to deploy technology and utilize strategies for special event management.

The **FDOT** is committed to facilitating the implementation of technology for special event management as described in the application. Details of the implementation and sustainability will have to be further refined and stakeholder input will need to be obtained to ensure that best and highest uses of new technology are installed in a way that creates the greatest public benefit.

The Pinellas County region is already well positioned as evidenced by:

- The partnerships and foundations that have been established through the development of varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives that have been or are being deployed by various Pinellas County region agencies and other entities.
- The leadership of Forward Pinellas, the metropolitan planning organization for the Pinellas County region in establishing a long-term framework for the deployment of critical ITS infrastructure.
- The experience of the Pinellas Region in managing the severe fluctuations of traffic in the region during Spring Break and during other special events. Due to this experience, we understand the technologies that can be leveraged to most effectively and efficiently improve the movement of people and goods within the County.

Advanced Transportation and Congestion Management Technologies Deployment Initiatives  
Page 2  
May 26, 2017

I would appreciate your favorable consideration of this multi-agency collaborative endeavor. The **FDOT** is fully committed to the concepts and looks forward to working with DPW and its partners to develop these concepts and ultimately move forward with implementation.

Sincerely,

A handwritten signature in blue ink that reads "Ronald A. Chin". The signature is written in a cursive style with a prominent initial "R" and a long, sweeping tail.

Ronald A. Chin, P.E.

District Seven Traffic Operations Engineer



June 12, 2017

Advanced Transportation and Congestion  
Management Technologies Deployment Initiatives  
Funding Opportunity Number DTFH6116RA00012  
U.S. Department of Transportation (USDOT)  
Federal Highway Administration (FHWA)  
Office of Acquisition and Grants Management  
1200 New Jersey Avenue, SE  
Mail Drop: E62-204. Washington DC 20590

Forward Pinellas, as the metropolitan planning organization for Pinellas County, is submitting this letter of support for the Pinellas County Department of Public Work's (DPW) proposal on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative" funding opportunity. The Pinellas County Region has all the ideal attributes to advance deployment of technologies in the region and leverage lessons learned from other areas of the Nation to deploy technology and utilize strategies for special event management.

Forward Pinellas is committed to facilitating the implementation of technology for special event management as described in the application. Details of the implementation and the sustainability of the program will have to be further refined and stakeholder input will need to be obtained to ensure that best and highest uses of new technology are installed in a way that creates the greatest public benefit.

The Pinellas County region is already well positioned for the implementation of this technology, as evidenced by:

- The partnerships and foundations that have been established through the development of varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives that have been or are being deployed by various agencies and other entities throughout Pinellas County;
- The leadership of Forward Pinellas for Pinellas County and the broader region in establishing a long-term framework for the deployment of critical ITS infrastructure; and

- The experience of the Pinellas area in managing the severe fluctuations of traffic in the region during Spring Break and during other special events. Due to this experience, we understand the technologies that can be leveraged to most effectively and efficiently improve the movement of people and goods within the county.

I would appreciate your favorable consideration of this multi-agency collaborative endeavor. Forward Pinellas is fully committed to the concepts and looks forward to working with DPW and its partners to develop these concepts and ultimately move forward with implementation.

Sincerely,

A handwritten signature in black ink, appearing to read 'Chelsea Favero', with a long horizontal flourish extending to the right.

Chelsea Favero, AICP  
Principal Planner



# CITY OF CLEARWATER

POST OFFICE BOX 4748, CLEARWATER, FLORIDA 33758-4748

MUNICIPAL SERVICES BUILDING, 100 SOUTH MYRTLE AVENUE, SUITE 220, CLEARWATER, FLORIDA 33756

TELEPHONE (727) 562-4750 FAX (727) 562-4755

## ENGINEERING DEPARTMENT

Advanced Transportation and Congestion Management Technologies Deployment Initiatives

Funding Opportunity Number DTFH6116RA00012

U.S. Department of Transportation (USDOT)

Federal Highway Administration (FHWA)

Office of Acquisition and Grants Management

1200 New Jersey Avenue, SE

Mail Drop: E62-204. Washington DC 20590

May 24<sup>th</sup>, 2017

The City of Clearwater Traffic Operations Department is submitting this letter of support for the Pinellas County Department of Public Work's (DPW) proposal on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative" funding opportunity. The Pinellas County Region has all the ideal attributes to advance deployment of technologies in the region and leverage lessons learned from other areas of the Nation to deploy technology and utilize strategies for special event management.

The City of Clearwater is committed to facilitating the implementation of technology for special event management as described in the application. Details of the implementation and sustainability will have to be further refined and stakeholder input will need to be obtained to ensure that best and highest uses of new technology are installed in a way that creates the greatest public benefit.

The Pinellas County region is already well positioned as evidenced by:

- The partnerships and foundations that have been established through the development of varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives that have been or are being deployed by various Pinellas County region agencies and other entities.
- The leadership of Forward Pinellas, the metropolitan planning organization for the Pinellas County region in establishing a long-term framework for the deployment of critical ITS infrastructure.
- The experience of the Pinellas Region in managing the severe fluctuations of traffic in the region during Spring Break and during other special events. Due to this experience, we understand the technologies that can be leveraged to most effectively and efficiently improve the movement of people and goods within the County.

I would appreciate your favorable consideration of this multi-agency collaborative endeavor. The City of Clearwater is fully committed to the concepts and looks forward to working with DPW and its partners to develop these concepts and ultimately move forward with implementation.

Sincerely,

Paul Bertels

Manager, Traffic Operations



"EQUAL EMPLOYMENT AND AFFIRMATIVE ACTION EMPLOYER"



## CITY OF ST. PETERSBURG

CITY OF ST. PETERSBURG, FLORIDA

RICK KRISEMAN, Mayor

Office of the Mayor

June 6, 2017

Advanced Transportation and Congestion Management Technologies Deployment Initiatives  
Funding Opportunity Number DTFH6116RA00012  
U.S. Department of Transportation (USDOT)  
Federal Highway Administration (FHWA)  
Office of Acquisition and Grants Management  
1200 New Jersey Avenue, SE  
Mail Drop: E62-204. Washington DC 20590

The City of St. Petersburg is pleased to provide our support for the Pinellas County Department of Public Works (DPW) proposal on behalf of the Pinellas County Region for USDOT's "Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Initiative" funding opportunity. The Pinellas County Region has all the ideal attributes to advance deployment of technologies in the region and leverage lessons learned from other areas of the nation to deploy technology and utilize strategies for special event management. We're very excited at the opportunity to partner with Pinellas County to enhance the experience for all who come to live, work, and play in St. Petersburg.

It's important to note that the City of St. Petersburg is home to approximately 250,000 residents and, together with our beach communities, is proud to welcome approximately 15 Million visitors each year. Downtown St. Petersburg serves as the home of the Tampa Bay Rays, a Major League Baseball franchise, as well as the Tampa Bay Rowdies, an NASL franchise that's currently in consideration for the MLS expansion. In addition to events held by those major sporting teams, St. Petersburg also hosts over 1,000 special events and festivals each year, including the Firestone Grand Prix of St. Petersburg, the St. Anthony's Triathlon swim/bike/run contest drawing ITU (International Triathlon Union) professional triathletes, the Mainsail Arts Festival, Ribfest, Bluesfest, American Stage in the Park, St. Petersburg Pride, the Drum Major for Justice Dr. M.L. King Jr. Parade and related celebrations, the Miss Florida Pageant, and First Night St. Petersburg. In addition to these special events, the City is St. Petersburg is home to a thriving dining and cultural arts scene that is enjoyed year-round, as evidenced by our ranking as the Number 1 Arts Destination for cities its size for three consecutive years. This is based in large part by St. Petersburg's collection of world-famous museums and galleries, including the Salvador Dali Museum, Museum of Fine Arts, The Chihuly Collection, Florida Holocaust Museum, Florida CraftArt, American Stage, The Morean Arts Center, and the Dr. Carter G. Woodson African American History Museum. In fact, in 2018, the City will welcome two new world-class museums including The James Museum with a premier collection of Western American art, and the Museum of the Modern Arts and Crafts Movement.

June 6, 2017  
Page 2

Finally, in late 2018/early 2019, the City will also see the re-activation of our 26-acre Pier District with the opening of a new municipal pier that's expected to draw another 1.7 Million visitors annually.

The City of St. Petersburg is committed to partnering with Pinellas County and other agencies as necessary to facilitate the implementation of technology for special event management as described in the application. Details of the implementation will have to be further refined and we look forward to assisting in garnering the stakeholder input that will be needed in order to ensure that the best and highest uses of the new technology, including the autonomous shuttles, are installed and deployed in a way that creates the greatest public benefit.

I believe that the Pinellas County region is already well positioned as evidenced by:

- The partnerships and foundations that have been established through the development of varied intelligent transportation systems (ITS), advanced traffic management systems (ATMS), and Mobility on Demand (MOD) initiatives that have been or are being deployed by various Pinellas County region agencies and other entities, such as St. Petersburg's Hybrid Smart Parking program that's anticipated in partnership with Streetline.
- The leadership of Forward Pinellas, the metropolitan planning organization for the Pinellas County region in establishing a long-term framework for the deployment of critical ITS infrastructure and multi-modal mobility options.
- The experience of the Pinellas region in managing the severe fluctuations of traffic during Spring Break and during other special events throughout the year as evidenced by the representative list of events hosted in St. Petersburg noted above.

I would appreciate your favorable consideration of this multi-agency collaborative endeavor. The City of St. Petersburg looks forward to working with Pinellas County and its partners to develop and advance these concepts into implementation.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rick Kriseman", with a long horizontal flourish extending to the right.

Rick Kriseman  
Mayor, City of St. Petersburg