

## Questions from the Audience

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### Our Panelists



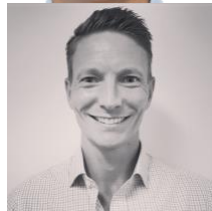
**Sugoon Fucharoen**  
AEROTHAI/CANSO  
*Moderator*



**SL Wong**  
ACI Asia-Pacific  
*Moderator*



**Stuart Ratcliffe**  
Metron Aviation  
/CANSO



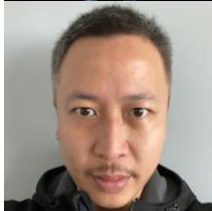
**Fredrik Lindblom**  
SAAB/CANSO



**Shane Sumner**  
ICAO Asia/Pacific



**Punya Shakya**  
ICAO Asia/Pacific



**Simon Cheoh**  
CAAS



**Herman Chung**  
Hong Kong  
International Airport



**John Moore**  
IATA Asia Pacific



**Satya Subramaniam**  
Bangalore  
International Airport

## Air Traffic Flow Management (ATFM)

### Q: Will there be a central authority for ATFM in the ASEAN region?

- **Sugoon Fucharoen:** Establishment of a central ATFM authority for the region requires a multilateral agreement at the highest policy level among States. Asia-Pacific region does not have that agreement currently. The region has opted for a Distributed Multi-Nodal ATFM Network concept, allowing States to retain ATFM responsibilities over their own FIRs while following a common guideline and operating procedure to ensure harmonized processes across the region. While a centralized model may be more effective in terms of network optimization, the adopted distributed model has functioned well so far owing to the willingness to collaborate among States and the continued development of information exchange technologies, including SWIM, to enable efficient exchange of pertinent information across borders.

### Q: How do the *Tactical ATFM operations* connect to *(Tactical) ATS operations*?

- **Stuart Ratcliffe:** Should there be a mature sophisticated system implementation, there could be the ability for the ATFM system to have connection to the ATM automation system allowing for CTOTs to be ingested and displayed on the electronic flight progress strips. Generally this is not done as, typically, there is only information flowing from the ATM automation system to the ATFM system. ATFM information can be displayed in the ATC units via a separate display showing information such as capacity/demand and ATFM measures. Besides the display of information there should be continuous CDM taking place between the ATFM unit and ATS operations via voice communications, e-mail, AFTN, and texting.

### Q: What are some examples of quantifiable benefits from ATFM implementation?

- **Simon Cheoh:** With ATFM implementation, there will be tangible and intangible benefits. Quantifying benefits from ATFM implementation could be fuel savings or carbon emissions reduction when flights trade air delay for ground delay and contribute to the whole ATM ecosystem. However, airlines have varying requirements and differing operating costs, which might need to be considered when quantifying benefits for ATFM implementation. Therefore, to ensure a holistic approach on ATFM benefits reporting, engagement with airlines partners would align expectations and the reported quantifiable benefits could be mutually agreed upon.

**Q: How is fairness, e.g. in terms of ATFM delay assigned to airlines, measured and ensured when implementing ATFM measures?**

- **Sugoon Fucharoen:** Generally, ATFM systems will try to optimize the network when balancing demand and capacity by minimizing ATFM delays assigned to flights overall. ANSPs can also ensure to configure their ATFM systems to not prioritize one airline over another, and consistently perform post-operations analysis to verify. One way to measure the “fairness” is to look at ATFM delays being assigned to different airlines; generally speaking, the amount of ATFM delays assigned should correlate with the level of traffic demand provided by the airlines. Comparing average ATFM delays across flights from different airlines being subjected to the same ATFM measure can also help determine if the system is (inadvertently or otherwise) favoring one airline over another.

**Q: How do various ATFM units in the region coordinate?**

- **Sugoon Fucharoen:** In the Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC), ATFM units coordinate via regular teleconferences - scheduled at once every 2 weeks currently (2021) but may change depending on traffic demand. Additionally, every ATFM unit has contact email addresses and phone numbers of other units; and phone calls are not uncommon when an urgent ATFM measure needs to be activated. ATFM Daily Plans (ADPs) are distributed via emails, while ATFM information such as CTOTs are distributed via ANSPs’ web portals, emails, and AFTN/AMHS messages. In the future, SWIM-based technologies will be utilized. In the Latin America and Caribbean region, under the CANSO ATFM Data Exchange Network for the Americas (CADENA) collaboration, ANSPs exchange information via regular weekly teleconferences and a regional Operational Information System (OIS - [www.cadenois.org](http://www.cadenois.org)).

**Q: What roles can ATFM play during this pandemic, given low traffic demand?**

- **Sugoon Fucharoen:** The Asia-Pacific Cross-Border Multi-Nodal ATFM Collaboration (AMNAC) has used the regular bi-weekly teleconference as an avenue to exchange ATM and ATFM status, as well as other pertinent information such as COVID-driven flight and passenger entry restrictions and infrastructure maintenance. Despite the low traffic demand and no requirement for ATFM measures, many aspects of ATFM process such as strategic planning for traffic demand recovery and collaborative decision making workflow can still remain relevant. ATFM measures can also be used to support contingency situations, which may include an ATC facility having to be closed for cleaning should an ATCO contract the virus.

## Q: What underlying infrastructures are required to kick-start ATFM?

- **Stuart Ratcliffe:** All ANSPs that have implemented ATFM have started from scratch. Most started with supervisors trying to manage demand and capacity manually, often with a pencil, a clipboard, and a telephone. Once that became difficult, excel spreadsheets were required. As airspace became busier, an automated solution was implemented. It is recommended that ANSPs follow the ICAO recommended implementation process (shown below) as this will enable them to build from the bottom as their needs dictate. Certainly, ATFM can be initially carried out simply and a sophisticated system is not required from the outset.



Figure II-8-1. ATFM implementation steps

## Q: When will advanced ATFM system-to-system interactions/data exchange enabled by SWIM be available?

- **Sugoon Fucharoen:** A definite “full implementation” timeline is difficult to predict but efforts have been ongoing to enable SWIM-based system-to-system ATFM information exchange, both in Asia-Pacific and globally. In Asia-Pacific, Common Regional VPN (CRV) has been an ongoing project which will provide an underlying infrastructure for SWIM-based communication for the region. The ICAO APAC SWIM Task Force has also been working hard on developing information exchange services and models to enable digital ATFM data exchange, with one of the most notable result being the development of [APAC FIXM Extension](#) which extends the core Flight Information Exchange Model (FIXM) to support ATFM and A-CDM data exchange. These efforts will continue, and the adoption of SWIM-based technologies will expand as the technologies mature.

**Q: Are there solutions available for precise prediction of weather and its impact, thus enabling a more accurate activation of ATFM measures?**

- **Stuart Ratcliffe:** There is an increasing demand for weather prediction tools which will assist the flow managers in their decision making, therefore technology suppliers have and will continue to develop predictive tools which take historical data, current weather, predicted weather, demand, capacity, airspace complexity, and traffic mix into consideration before supplying recommended actions to the flow managers. Ultimately the flow manger will be able to draw on this information to assist him in his decision making.

## Airport Collaborative Decision Making (A-CDM)

**Q: In a country where ATFM is not yet implemented, will A-CDM at the airport(s) still be beneficial?**

- **Satya Subramaniam:** At Bangalore Airport, we implemented local A-CDM first and then ATFM was implemented. With local A-CDM, we sequenced the flight and avoided holding delays. We concentrated on deriving accurate TOBT in the first stage; and in the second stage, TSAT was derived based on TOBT. These trials were done elaborately, and later implementation was planned progressively.
- **SL Wong:** A-CDM is definitely beneficial even without an ATFM system connected to it. The two can well operate independently as separate systems but their integration creates additional benefits as a result of the synergy.
- **Fredrik Lindblom:** A-CDM has proven to provide benefits for the A-CDM stakeholders even without having ATFM implemented. Several airports in the APAC region have reported benefits like shorter taxi-times, lower fuel consumption, better OTP, better resource utilization, to name a few. This is consistent with the results seen in Europe as well. It is recommended to read the impact assessment made by EUROCONTROL back in 2016 which can be found here: <https://www.eurocontrol.int/sites/default/files/2019-04/a-cdm-impact-assessment-2016.pdf>

**Q: How does the Actual Ready Time (ARDT) get logged into the A-CDM system?**

- **Satya Subramaniam:** At Bangalore Airport, we consider Door Close time as the Actual Ready Time, when all below & above wing activities are completed. We get these timestamps through the “Turnaround Management” application or manually through TMRS at the Airport Ops Control Center, which updates the database.
- **Fredrik Lindblom:** The most common way that I have experienced is that when the Pilot calls ready to ATC, the ARDT is logged via an entry into the ATC EFS system or directly into an A-CDM Portal. There are also other ways to do this, like in the Bangalore case. Most importantly is to have a dialogue with the stakeholders **HOW** this is to be done at your airport and then document this in a “Procedure Document”.

**Q: At an airport that acts as a hub for a large airline, should the airline co-invest in the A-CDM implementation?**

- **Fredrik Lindblom:** To my knowledge I am not aware of any implementation where the hub airline has co-invested in the A-CDM solution/implementation. I do, however, want to emphasize that all stakeholders will have to “invest” their time by working on the project, typically contributing with operational and IT personnel/expertise. The stakeholders, like the airlines, might also have to invest in certain upgrades to their current system to integrate (both send and receive) e.g. TOBT and TSAT information.

**Q: What are some examples of quantifiable benefits from A-CDM implementation?**

- **Fredrik:** There are several examples of quantifiable benefits that A-CDM has delivered related to shorter taxi-times, lower fuel consumption, better on-time performance (OTP), and better resource utilization, to name a few. One recommended document to read is the assessment made by EUROCONTROL which can be found at <https://www.eurocontrol.int/sites/default/files/2019-04/a-cdm-impact-assessment-2016.pdf>.

## ATFM/A-CDM Integration

**Q: Can an implementation of A-CDM, and consequently adherence to A-CDM time elements such as TSAT, cause conflict for the airlines when they also must adhere to their airport slot times such as SOBT?**

- **Satya Subramaniam:** Airlines have no issue when TSAT time is close to SOBT. However, when we have CTOT for certain flights, airlines sometimes have a query and the logic / reason of CTOT has to be explained by the Control Center. The second scenario is when their flights arrive late and the immediate slot is full; questions are raised and the same is explained. This is where the Control Center plays a vital role. Typically, these scenarios are predicted early in our airport environment by the Airport Ops Control Center (AOCC) and decisions are taken by stakeholders collaboratively.

**Q: For ATFM, A-CDM, and ATFM/A-CDM Integration, who should be responsible for the investments required?**

- **Satya Subramaniam:** ATFM investment should ideally come from the ANSP, and A-CDM investment should come from the Airport Operator or as agreed in the A-CDM implementation MoU.
- **Fredrik Lindblom:** The ATFM/A-CDM integration will likely require investments on both the A-CDM and ATFM system, at a minimum to do testing to make sure that it operates adequately. Whoever made the initial investments for A-CDM and ATFM will then, again very likely, have to make additional investments.



## Organization-Specific Questions

### APAC Cross-Border Multi-Nodal ATFM Collaboration (AMNAC)

**Q: In a Distributed Multi-Nodal ATFM Network, how do different countries/ATFM nodes agree with each other, when the countries/nodes may have different interests?**

- **Stuart Ratcliffe:** Through the CDM process, ANSPs will contact each other and discuss their individual interests and solutions and come to an agreement on how to best serve the interests of all stakeholders.

**Q: How do you manage to integrate traffic from States that are not included in the ATFM collaboration?**

- **Stuart Ratcliffe:** In most regions, international flights are excluded from ATFM measures. So in other words, traffic coming from South America flying into the U.S. national airspace are exempt from an ATFM measure which may be in place at an airport or airspace sector. These flights are taken into consideration when ATFM measure is published but they receive no delay. This of course means that the domestic traffic takes all the delay. In the APAC Multi-Nodal ConOps, there are various levels of ATFM readiness. A Level-3 ANSP has the ability to create and distribute GDPs and they will include flights from other Level-3 ANSPs and Level-2 ANSPs who have agreed to comply with CTOTs issued by the Level-3 ANSPs. Level-1 ANSPs do not have the infrastructure to comply with the CTOTs, so the Level-3 ANSPs will exclude flights coming from those countries when implementing an ATFM Measure. There are countries that are going to implement LR-ATFM which will include long range flights in the ATFM measure so as to evenly distribute the delay to all flights and not just flights participating in the ATFM measure.

**Q: In a Distributed Multi-Nodal ATFM Network, what are the consequences of an ATFM node disrespecting ATFM measures requested by another node?**

- **Stuart Ratcliffe:** Currently there is no punitive action that can be taken. ANSPs that are issuing CTOTs carry out compliance monitoring in the post-operations phase of ATFM. This will include compliance metrics on ANSPs and airlines. These figures are published and displayed at AMNAC meetings. Errant ANSPs are asked to explain non-compliance to the issuing ANSPs and organizations such as IATA and CANSO. In some regions in the world, ATC has the authority to take non-compliant aircraft out of an arrival sequence and place the aircraft later in the sequence; this can be an option in the future if procedures can be implemented to facilitate the process.

### Bangalore International Airport

**Q: Has Bangalore International Airport implemented all A-CDM milestones?**

- **Satya Subramaniam:** We would say all milestones are achieved at our airport. That is because some are being received in semi-auto mode; it comes through stakeholders available in Ops Control Center.

**Q: At Bangalore International Airport, are the In-Block Times collected automatically and if so, how?**

- **Satya Subramaniam:** In-Block Times are integrated in following ways
  - Time Stamps captured via A-VDGS system, this is around 40% of parking stands.
  - On non-A-VDGS stands it comes through either our “TurnAround Manager” app or through manual update by stakeholders’ staff available in Ops Control Center.

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