To create a security case for ACAS Xu using the provided security case pattern, I will replace all placeholders with ACAS Xu-specific information and address undeveloped and uninstantiated elements according to the context and system requirements of ACAS Xu.

\*\*Security Case for ACAS Xu:\*\*

- \*\*G0: ACAS Xu satisfies security requirements\*\*

- \*\*C0: ACAS Xu is designed for unmanned aerial vehicles to prevent collisions.\*\*

- \*\*C1: Security requirements are about protecting the system from malicious entities.\*\*

- \*\*J0: The argumentation is based on satisfaction of security requirements.\*\*

- \*\*A0: System security requirement specifications (SRS) are complete, adequate, and consistent.\*\*

- \*\*S0: Argue through asset protection and secure development requirements\*\*

- \*\*G1: ACAS Xu satisfies the asset protection requirements\*\*

- \*\*A1: Asset inventory is established.\*\*

- \*\*S1: Argue through the different stages of the system development life cycle\*\*

- \*\*G3: Asset protection requirements are met during the architecture design phase.\*\*

- \*\*C2: The architecture of ACAS Xu involves sensors, processors, planners, and actuators.\*\*

- \*\*S2: Argue through deriving security threats from SRs.\*\*

- \*\*G5: ACAS Xu architecture is protected against identified security threats\*\*

- \*\*A2: All relevant threats have been identified.\*\*

- \*\*S3: Argue over each security threat\*\*

- \*\*- G0.1: ACAS Xu architecture is protected against tampering with GPS and processor data.\*\*

- \*\*- G0.2: ACAS Xu architecture is protected against spoofing involving unauthorized sensors.\*\*

- \*\*- G0.3: ACAS Xu architecture is protected against elevation of privileges within the planning system.\*\*

- \*\*G6: ACAS Xu architecture is validated (undeveloped)\*\*

- \*\*C3: Description of ACAS Xu's architectural model.\*\*

- \*\*A3: ACAS Xu architecture model is well defined in formal methods. (uninstantiated)\*\*

- \*\*G4: Asset protection requirements are met during other phases (undeveloped)\*\*

- \*\*G2: ACAS Xu satisfies secure development requirements (undeveloped and uninstantiated)\*\*

This arrangement follows the GSN hierarchical tree structure, instantiating from the generic pattern to address specifics of the ACAS Xu system. The key security threats against ACAS Xu have been detailed in corresponding goals (e.g., G0.1, G0.2, G0.3). Each element supports the higher-level goals or strategies it is connected to, thereby creating a thorough argumentation line supported by evidence and justifications, augmented with assumptions and contextual information. Specific instantiations replace placeholders, and strategies for handling identified threats are developed, taking into account ACAS Xu's architectural and operational specifics. Uninstantiated elements that still require system-specific information are noted as such. Elements denoted as "undeveloped" imply an area where further development is necessary to complete the assurance argument.